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This descriptive and evaluative report covers a National Defense Education Act, Title XI, summer institute which was attended by 24 industrial arts teachers, supervisors, and teacher educators from 15 states. The objectives of the institute were to teach information about industrial materials and to allow participants to develop instructional and curriculum materials involving instructional media. Industrial arts faculty at San Jose College were responsible for planning and conducting the institute. The bases used for evaluation were staff estimation, a pre- and post-test of the participants' knowledge of industrial materials, and a survey of participants to determine satisfaction with several aspects of the institute. General conclusions were positive and indicated participant growth, successful curriculum materials development, increased knowledge of industrial materials and instructional media, and increased use of such knowledge through planned inservice education or updated instruction. The appendixes include questionnaires, sample curriculum materials, and evaluation data. (EM)

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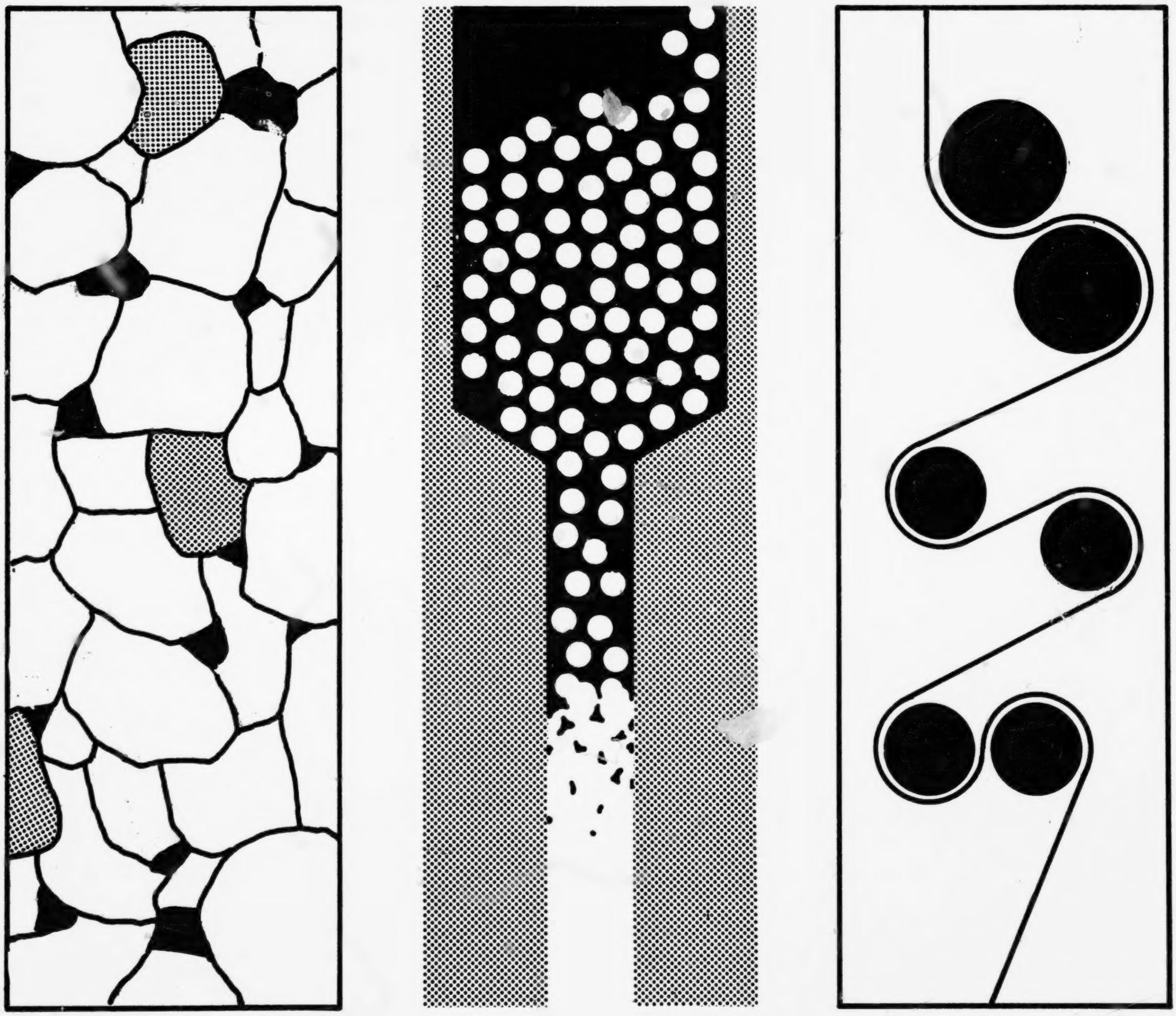
INDUSTRIAL MATERIALS

NDEA INSTITUTE
SAN JOSE STATE COLLEGE
JUNE 24 - AUGUST 2, 1968



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FINAL TECHNICAL REPORT
ON THE INSTITUTE FOR: ADVANCED STUDY IN INDUSTRIAL ARTS

AT: SAN JOSE STATE COLLEGE

DATES: DECEMBER 7, 1967 (FROM) SEPTEMBER 30, 1968 (TO)

SUBMITTED BY: Ralph C. Bohn
RALPH C. BOHN
DIRECTOR

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INTRODUCTION

The final report is supposed to mark the ending of the program. Yet, if the Institute has been a success, this report should only mark the termination of formal instruction and should introduce a period of instructional improvement in the industrial materials phase of industrial arts.

This Institute was developed to fulfill the following selected NDEA Title XI objectives, as interpreted by the Director. These include:

1. Improvement of instruction and updating of the curricular offerings of teachers in attendance.
2. Development of new instructional materials which may lead to improved instruction and contribute to the available knowledge. In this case, the Institute concentrated on developing instructional units based on the technical content presented in the Institute. The work of the 1967 NDEA Industrial Materials Institute was used as a point of departure. Units developed included the experimental devices developed last year, as well as an organized presentation for instruction, including current educational media. These units can be integrated into the laboratory activities of ongoing industrial arts programs, or be used for an organized course in industrial materials.
3. Provide for impact in different areas of the country through the selection of leadership and potential leadership personnel. This should produce wider dissemination of the knowledge developed and learned at the Institute.

This report has been prepared in lithograph to permit its distribution to the teachers in attendance in both 1967 and 1968, the faculty, appropriate college officials, and others requesting information on the Institute. The format described in the Handbook for Directors was followed. However, a few modifications were made to the suggested method of presentation. These include:

1. Inclusion of Descriptive Information. The manual indicates that the main body of the report be identified under the classification of Evaluation. Also, the report should be evaluative rather than descriptive. Every effort was made to comply with this request. However, it was not possible to be evaluative of activities that were not described, without making an erroneous assumption that the reader had prior knowledge of the total institute program. While

this assumption might be appropriate for USOE personnel and teachers in attendance, it is not appropriate for college officials and other interested people. As a result, both descriptive and evaluative information was included in this section. The descriptive materials was included so that the report may be used by others in gaining an understanding of the program, as well as reviewing the evaluation.

2. Division of Evaluation Section. The evaluation section was divided into three distinct sections. These include:

    a. Evaluation - Preplanning

    b. Evaluation - Summer Program

    c. Evaluation - Content and Student Evaluation Reports

Besides this report, the institute produced a series of teaching units appropriate for secondary and teacher education use. These units were planned and developed by the teachers in attendance. Educational media, such as overhead projection materials and slides were prepared with the unit. Student experiments and activities were planned to help lower the level of abstraction. Teaching and experimental devices developed by the 1967 NDEA Title XI Institute in Industrial Materials were integrated into some of the units.

These units have been compiled into a single report so that teachers in attendance could profit from the efforts of others. Plans were also made to make copies of the units available to last years participants, as well as other interested educators.

EVALUATION - PREPLANNING

Institute preplanning involved all activities beginning with the preparation of the initial proposal, through contract negotiations, selection of participants, and arrival of participants for the instructional program.

The importance of this period can't be over emphasized. Weaknesses in planning the instructional program, selection of participants, providing appropriate housing, etc., can materially effect the total program. As a result, this phase of the program received considerable attention. Efforts were made to make certain that the participants arrived with a knowledge of the program, as well as some indications of problems they might encounter with living and studying at San Jose State College.

Relations with USOE

The USOE was very cooperative and helpful during all phases of program planning and contract negotiations. The Industrial Arts Division, the one with which we had almost exclusive contact, provided all necessary assistance. Questions were answered promptly and every effort was made to assist us in planning the best possible program.

Relations with College Administration

San Jose State College is deeply involved with the inservice education of teachers. The 1968 summer session at San Jose State had 12,400 students, approximately 57% of our regular San Jose State population. The majority of people in attandance during the summer are elementary and secondary teachers seeking in-service education. As a result, the college has accepted a major responsibility in in-service education and has provided full cooperation and encouragement for conducting NDEA Title XI Institutes.

The services provided by the college are, by necessity, limited to support and fiscal activities. The planning of the program must be conducted by the staff within the department in which the Institute will be held. At San Jose State, both support and fiscal matters were handled in an effective and expeditious manner by the Research and Foundation Offices.

Washington Directors' Meeting

The Washington Directors' meeting was a valuable experience and assisted us in the following manner:

1. Provided an opportunity to meet with the Industrial Arts Specialist and his staff, as well as all other

industrial arts directors. The formal and informal discussions answered numerous questions, solved some problems, and most important - informed us of techniques used by others to make institutes more effective.

2. Presented the need for appropriate programs to up date instruction in the schools. This presentation was effective, and aided us in planning the Institute.

3. Reinforced and clarified the objectives of NDEA Title XI.

4. Considered specific budget problems. These were discussed and proper procedures for meeting unforseen circumstances presented.

5. Provided for an informal directors meeting at the AIAA convention in Minneapolis to consider problems which might develop by that time. Also, established the procedures for mailing brochures in a single packet through the AIAA.

Pre-Institute Preparation

Pre-institute preparation included the preparation and distribution of the brochures, collection and cataloging of applications, selection of participants, communications with participants in preparation for their attendance, and pre-planning of the instructional program.

Preparation and Distribution of Brochure - Ten thousand brochures were prepared and distributed to the profession. The information included in the brochure is presented as Appendix A. Prior to distribution of the brochure, the American Industrial Arts Association (AIAA) offered to mail copies of all industrial arts institute brochures to their members. Since this membership comprises a broad cross section of industrial arts teachers throughout the United States, this seemed to be an efficient way of informing the profession fo the institute. The AIAA agreed to provide this service, divide the cost of the mailing between all institutes participating, and pay part of the cost from the association budget. We provided 8000 brochures which were mailed to all AIAA members in January, 1968. In addition, we forwarded individual copies of the brochures to everyone that requested information. Requests were generated by USOE publicity and by the announcements listed in all industrial arts professional journals. The following distribution of brochures was made:

1. American Industrial Arts Association Membership - Regular Members (excluding all students)	8,000

2.	San Jose State College Industrial Studies Department Mailing Lists	950
3.	Individual Requests for Brochures	615
	TOTAL:	9,565

When a request for the application packet was received on the tear slip from the back of the brochure, we were able to identify whether the request was generated by the AIAA distribution of brochures, or by the brochures mailed to individuals by their request or by department mailing lists. The following division of application requests was observed:

1.	Application requests generated by AIAA mailing to their membership	180
2.	Application requests generated by Department mailings or individual requests	240
	TOTAL:	420

We found the cooperation of the AIAA extremely valuable in the dissemination of information on the Institute. They announced all industrial arts institutes a few days after approval. A large number of the individual requests were generated by this initial announcement.

The AIAA mailing of brochures to each member, the announcement in their newsletter, the requests resulting from announcements carried in each of the major industrial arts journals and from the USOE listing of Institutes sent to all elementary and secondary schools, provided the broad distribution of information required. As a result of these procedures, we had almost no late requests or complaints from people who indicated they heard about the institute too late to apply.

Collection and Cataloging of Applications - In order to provide for accurate mailing of application information, self-addressed stamped envelopes were included with all application packets. In addition, a letter describing the application procedure in detail was included with each packet. Each packet contained the following items:

1. Letter describing application procedure (copy included as Appendix B)

2. Application Form (OE 4401)
3. Supplement to Application Form (copy included as Appendix C)
4. Applicant Record Card (OE 4402)
5. Confidential Evaluation Form (OE 4403)
6. Institute Brochure
7. Two stamped return envelopes

As applications were received, they were checked for completeness and all correspondence considered and answered, as appropriate. The total application procedure required individual mailings by the applicant (application blank), school administrator (recommendation), and former colleges or universities (transcripts). A system for cataloging and checking the different parts of the application was established. When all materials were received, the application was stapled to all other materials and placed in file for evaluation.

As the application deadline approached, a letter was sent to each person who had submitted some application materials, but had not completed the process. A copy of this letter is included as Appendix D.

A number of teachers previously attending industrial arts institutes applied for the SJSC program. These people were sent a letter indicating their ineligibility to attend the institute. A copy of this letter is included as Appendix E. A total of 18 of these letters were sent.

There were also 9 applicants ineligible because they didn't meet the selection criteria. Individual letters were sent to these people explaining the reason for their ineligibility.

This phase of the program operated efficiently and without incident. The credit should go to the efficient secretaries who maintained all records and were responsible for all correspondence with the applicants.

Selection of Participants - As applications were completed, a check-in form was attached and filled out for each applicant (a copy of this form is included as Appendix F). A total of 212 complete applications were received and considered. Only 14 applications were incomplete. They were evaluated using the provided information.

Since the number of applicants from teachers of general industrial arts, metals, and woods exceeded the other areas of industrial arts, more applicants from these areas were accepted. In order to provide for group discussion, at least one applicant from each of the following areas was selected to participate. The actual number attending is listed behind each area:

1. Automotive & Power (1)
2. Drafting (2)
3. Electricity/Electronics (2)
4. General Industrial Arts (5)
5. General Metals (7)
6. General Woods (4)
7. Graphic Arts (1)

The division between different types of professional responsibilities was:

1. Junior High Teachers (8)
2. Senior High Teachers (8)
3. Supervisors (2)
4. Teacher Educators (6)

Selection criteria was based on the published eligibility requirements and consisted of an evaluation of the following requirements:

1. Three years teaching and/or supervisory experience as an industrial arts teacher (grades 7-12), supervisor, or teacher educator.
2. Teaching area of metals, woods, plastics, drafting, graphic arts, electronics, auto and power, or general industrial arts (general shop).
3. Bachelor's or Master's degree with a major in industrial arts (verified by college transcript).
4. Contract or agreement to continue, during 1967-68, teaching in grades 7-12, supervision, or teacher education requiring a knowledge of industrial materials.
5. One year of college chemistry, including organic and inorganic chemistry. In some cases, this requirement was met by verified experience or self-study.

6. Written recommendation of immediate supervisors (school principal or superintendant). This recommendation had to show that the participating teacher would be encouraged to use institute experiences.

7. Statement describing interest in industrial materials and its relationship to industrial arts instruction, and interest and reason for participation in the institute.

The evaluation of all applications was conducted by a committee consisting of the director and the two principle staff members (Ralph Bohn, Louie Melo, and Don Betando). Each application was reviewed and rated by each member of the committee. The final selection was based upon the composite rating, and was accomplished by group consideration of all applications rated near the top. Twenty-four applicants and twenty-four alternates were selected.

Following the selection, letters were sent to each applicant identifying his status. The letters to applicants selected included necessary forms needed to authorize payments of the stipends. Appendix G contains a copy of the letter sent to those selected. Appendix H contains a copy of the letter sent to the alternates, and Appendix I contains a copy of the letter sent to those we were unable to accept.

Sixteen of the twenty-four selected accepted the invitation and subsequently attended. The other eight notified us they would be unable to attend. Eight alternates were called and all accepted the invitation and subsequently attended. (A list of the people in attendance, including their home addresses and pre-institute school addresses is included as Appendix J).

The following table shows the distribution of participants by States:

TABLE 1

DISTRIBUTION OF PARTICIPANTS BY STATES

STATE	NUMBER ATTENDING
ARIZONA	1
CALIFORNIA	8
COLORADO	2
GEORGIA	1
KANSAS	1
LOUISIANA	1
MASSACHUSETTS	1
MICHIGAN	1
NEW YORK	1
OHIO	1
OREGON	1
PUERTO RICO	1
SOUTH DAKOTA	1
WASHINGTON	1
WISCONSIN	2

TOTAL: 15 STATES - 24 PARTICIPANTS

The entire class was asked to keep us informed of their mailing addresses and changes in assignments. As a result, an up-to-date mailing list should be available, as needed, during the next school year.

After the eight alternates had accepted and the group was complete, a second letter was sent to the remaining alternates explaining that positions still might be available, but that the chances of joining the institute were not good. A copy of this letter is included as Appendix K.

No unanticipated problems developed during this phase of preplanning. The efficient maintaining of records and prompt replies to all correspondence is credited to efficient institute secretaries.

Communications with Participants in Preparation for Their Attendance - Once the class had been established, the problems of bringing the group to San Jose, providing for appropriate housing, and considering the numerous needs of the participants and families was undertaken. Basically, this phase consisted of the following activities:

1. Preparation and mailing of letter to all participants on April 25, 1968, regarding housing (included as Appendix L). The letter provided for a variety of housing and attempted to provide a realistic picture of available accomodations. The problem of refunds was described since this can be a major source of concern, and seriously distract participants from instruction.

   Attached to the letter was a question form which encouraged questions regarding any aspect of the Institute.

2. Preparation and mailing of letter with curriculum enclosures, and some basic information (included as Appendix M).

3. Preparation and mailing of a Question and Answer report to all participants on May 14, 1968. This report was prepared in response to the questions asked by the participants as they responded to the April 25 letter. A copy is attached as Appendix N.

4. Preparation and mailing of letter to all participants on May 29, 1968, regarding stipend payments, invitation to a barbecue, suggested study, and other miscellaneous information. A copy is included as Appendix O.

Attached to the letter was a request for information regarding their housing and travel plans.

5. In addition to the letters noted, other information was mailed as it became available. This included:

    a. Names and addresses of all industrial arts teachers selected for the Institute, as well as a similar list of last year's participants.

    b. Maps of San Jose and brochures describing recreational activities in the Bay Area.

    c. Course outline and list of text and reference books on industrial materials.

    d. Copy of report showing experiments and experimental devices prepared by participants in 1967 Institute.

Mailings were timed so that participants received some information each week. Large, all inclusive mailings were avoided. It was hoped that frequent small mailings would show the participants we were looking forward to their arrival, and also provide more assurance that the contents of the mailings were read.

In general, this phase of preplanning was conducted without difficulty. Experiences with previous institutes plus the housing management experience of one of the secretaries assisted in eliminating conditions which could produce problems.

Preplanning of the Instructional Program - Each of the principle faculty members planned his part of the instructional program. A number of meetings were held to coordinate planning. As a result, the program was planned and ready to begin on Monday, June 24, 1968.

Orientation of Participants

The orientation of participants was a continuous process, beginning with the initial letter of acceptance and continuing throughout the Institute. The correspondence described during the previous pages was directed toward orientating the participant to both the community and the instructional program.

On Sunday, June 23, 1968, the day before the Institute began, all participants and their families were invited to a barbecue at the Director's home. Twenty three of the 24 participants, and all faculty and staff attended. The twenty fourth participant arrived in San Jose on Sunday evening, too late for the barbecue. The purpose was to informally become acquainted with the staff and with the other participants. This barbecue was followed by an orientation session on Monday morning. During this session, registration was completed, an overview of the total instructional program was presented, and numerous administrative type talks (such as parking permits) were discussed. Dr. Robert Moore, Dean, School of Applied Science and Arts, officially welcomed the group. A tour of the industrial studies building followed the initial orientation session.

Physical Facilities

The physical facilities used by the Institute were adequate and met every need of the participants. Four rooms were assigned to the exclusive use of the Institute. These included a large classroom (planning center of the auto lab), the industrial materials lab, a connecting small clossroom, and the general industrial arts laboratory. In addition, all other areas of the building were available for use as needed. These included extensive facilities in drafting, woodworking, metals and machine-tools, electricity/electronics, automotive and power, industrial design, and graphic arts.

Study carrels containing complete facilities for individual study and review of films were constructed in the classroom connected to the industrial materials laboratory. These facilities were available at all times, including evenings and week ends. All available films on industrial materials were ordered and made available for review. Review cards were completed and the results of all reviews published for use by the participants.

The industrial materials library was contained in the same area as the study carrels and permitted in-depth reference study. In addition, some reference books from the general college library were placed in the reserve reading room for use by the participants.

EVALUATION - SUMMER PROGRAM

The suggested format for this report will be modified for items 7-13, permitting a descriptive presentation of the summer program. The Institute was divided into two principle phases of operation:

1. Technological Study of Industrial Materials
2. Preparation of Instructional Units usable in Junior High, Senior High, or Collegiate Instruction in Industrial Materials.

Two secondary phases, educational media and field experience in teaching industrial materials, were integrated into the second, or curriculum phase of the program.

The typical daily schedule was:

8:00 - 9:45 - Phase I presentation lecture-demonstration-discussion, audio-visual presentation, etc.
9:45 - 10:00 - Coffee-refreshment break, informal discussion.
10:00 - 11:30 - Phase I laboratory period experiments and testing to enforce content presentation.
11:30 - 12:30 - Lunch.
12:30 - 2:15 - Phase 2 presentation seminar meetings, discussions, demonstrations, guest speakers, etc.
2:15 - 2:30 - Coffee-refreshemnt break, informal discussion.
2:30 - 4:00 - Phase 2 laboratory period development of instructional units, student activities, appropriate educational media, and individual study.

Day-by-Day Schedule Course Content

A day-by-day presentation of course content is included to permit the reader to review the instructional programs conducted during the Institute. The entries are brief so that the report can be kept to a reasonable size.

Date: June 24
Session: Morning
Type of Instruction: Opening Session
Instructor: Dr. Ralph Bohn, Director
Topic: Orientation
Content: Dr. Bohn introduced Dr. Robert Moore, Dean of the School of Applied Arts and Science, who gave a welcome address to the group. Registration was completed and the group was given a tour of the building.

Date: June 24
Session: Afternoon
Type of Instruction: Lecture
Instructor: Mr. Louie Melo, Professor
Topic: Overview & Introduction to Industrial Materials
Content: Mr. Melo presented an introduction program to industrial materials via a collection of 35 mm color slides. The program emphasized the important role of materials to man in a past, present, and future perspective.

Date: June 25
Session: Morning
Type of Instruction: Lecture & Examination
Instructor: Louie Melo
Topic: Industrial Materials in Industrial Arts
Content: Mr. Melo presented an overview of the importance of materials in an Industrial Arts Department. The participants then took a comprehensive 2 hour examination of industrial materials to use as a measuring device at the end of the institute.

Date: June 25
Session: Afternoon
Type of Instruction: Lecture Demonstration
Instructor: Mr. Donald Betando, Associate Professor
Topic: Instructional Media
Content: Mr. Betando presented the concept of Instructional media with examples of a slide-tape demonstration. Mr. Ken Rushing, Institute Instructor, introduced the study center and explained the function of the study carrels.

Date: June 26
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Louie Melo
Topic: Atomic Structure of Materials
Content: A discussion of the basic atomic structure of all matter including: compositions, ionic, covalent and metallic bonding.

Date: June 26
Session: Afternoon
Type of Instruction: Lecture Demonstration
Instructor: Don Betando
Topic: Audio-Visual Techniques
Content: Continuation of instructional materials development by Mr. Betando. Dr. Jerry Kemp of the San Jose State College Audio-Visual Department demonstrated the many techniques of teaching with A-V materials.

Date: June 27
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Louie Melo
Topic: Crystal Structure and laboratory demonstrations
Content: Crystal structure and stress strain curves were discussed. Various impressive and instructional aids were used to aid the presentation. Mr. David Bockman, Institute Instructor, then introduced the participants to some of the lab equipment via demonstrations.

Date: June 27
Session: Afternoon
Type of Instruction: Lecture Demonstration & Independent Study
Instructor: Mr. Richard Szumski, Audio-Visual Dept.
Topic: Techniques of making Audio-Visual Materials
Content: Demonstration of the use of the copy camera. Resource center open 4 - 6 pm for independent study.

Date: June 28
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Louie Melo
Topic: Properties of Metals and their Alloys
Content: The physical and mechanical properties of

ferrous and non-ferrous metals were examined. The value of alloy phase and transformation diagrams was shown.

Date: June 28
Session: Afternoon
Type of Instruction: Seminar - Independent Study
Instructor: Don Betando, Ralph Bohn, Ken Rushing
Topic: Curriculum Development to include materials into existing IA programs
Content: The institute participants were divided into 3 groups and each group began to develop curriculum to include materials into existing IA programs. The groups & their leaders were: (1) College - Dr. Ralph Bohn (2) Senior High - Ken Rushing (3) Junior High - Don Betando. 4 - 6 pm Resource Center.

Date: June 29
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Dave Bockman
Topic: Properties of Metals
Content: Mr. Bockman presented a demonstration of the powder metallurgy procedures to the group. Lecture and experiments on corrosion were conducted in the lab.

Date: June 29
Session: Afternoon
Type of Instruction: Seminar & Independent Study
Instructor: Betando, Bohn, Rushing
Topic: Curriculum Development
Content: The three groups continued developing the curriculum guidelines to include materials in IA. 4 - 6 pm - Research Center.

Date: July 1
Session: Morning
Type of Instruction: Lecture
Instructor: Louie Melo
Topic: Causes & Effects of Corrosion; Introduction to Physical & Chemical Properties of Wood
Content: The area of metals and corrosion was terminated with a demonstration of rapid oxidation in a ferrous material with the aid of a welding torch. The area of wood cellular and molecular composition was introduced.

Date: July 1
Session: Afternoon
Type of Instruction: Seminar - Independent Study
Instructor: Betando, Bohn, Rushing
Topic: Development of Curricula
Content: Individual Instruction Conferences & Lab experiments. Presentation of curriculum outline by Junior High group.

Date: July 2
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Mr. Bill Nemy & Dale Musselman, Brodhead-Garrett
Topic: Woods (Guest Speakers)
Content: Mr. Nemy and Mr. Musselman discussed the trends of schools toward materials testing equipment.

Date: July 2
Session: Afternoon
Type of Instruction: Lecture Demonstration & Independent Study
Instructor: Dr. Jack Chaplin, San Jose State College Staff
Topic: Processes & Mechanisms
Content: Dr. Chaplin demonstrated mechanisms and processes with the use of a trailer demonstration unit: 1. Power Metallurgy, 2. Pneumatics, 3. Hydraulics & air gauges, 4. Drop Forge. Presentation of Senior High Curriculum Outline. Lab and curriculum development.

Date: July 3
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Louie Melo
Topic: Fuels
Content: A general overview of the chemical and physical properties of fuels, followed by an impressive demonstration pointing out the combustion qualities of fuels when heated and atomized. Problems of over-rich and over-lean fuel mixtures were also demonstrated.

Date: July 3
Session: Afternoon
Type of Instruction: Seminar - Independent Study

Instructor: Bohn
Topic: Curriculum
Content: The college group presented their curriculum development. The remainder of the afternoon was spent in laboratory experiment and development of Instructional aids.

Date: July 8
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Louie Melo
Topic: Oils and Greases
Content: A series of demonstrations which emphasized the lecture material. Demonstrations included pH of lubricants, various methods of measuring viscosity, lubricants in different environments, flash and fire points, and characteristics of various greases.

Date: July 8
Session: Afternoon
Type of Instruction: Lecture Demonstration
Instructor: Mr. Gary Spear, Institute Designer
Topic: Audio-Visual Technique
Content: Demonstration of several techniques for the production of overhead transparencies. Mr. Betando held independent study conferences and unit development lab work continued.

Date: July 9
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Louie Melo
Topic: Polymers
Content: Polymers or plastics were presented. Theory and experimentation with polymer materials suitable for inclusion in the high school industrial arts programs were discussed. Lab experimentation followed.

Date: July 9
Session: Afternoon
Type of Instruction: Independent Study

Instructor: Bohn
Topic: Unit Development
Content: Independent Study was continued in the development of curriculum units.

Date: July 10
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Louie Melo
Topic: Adhesives
Content: The area of adhesives was introduced to the group. The physical properties characteristic of adhesives were discussed, followed by several demonstrations in the laboratory.

Date: July 10
Session: Afternoon
Type of Instruction: Independent Study
Instructor: Bohn
Topic: Unit Development
Content: Independent study was continued in the development of curriculum units.

Date: July 11
Session: Morning
Type of Instruction: Symposium on Industrial Arts

Date: July 11
Session: Afternoon
Type of Instruction: Seminar
Instructor: Betando
Topic: Overview of Industrial Arts
Content: Participants discussed the morning symposium. Field trip to Haveg Industries, A Division of American Molding Company in San Leandro, where the molding of thermosetting and thermoplastic polymers were seen.

Date: July 12
Session: Morning
Type of Instruction: Question and Answer Session

Date: July 12
Session: Afternoon
Type of Instruction: Seminar
Instructor: Ken Rushing
Topic: Mid-term Institute evaluation
Content: Mr. Rushing led a discussion on the evaluation of the content and methods of conducting the institute. The participants were asked to submit a written evaluation of the program.

Date: July 15
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Louie Melo
Topic: Coatings
Content: Lecture describing the various types of coatings and their relationship to adhesives. Demonstration following which illustrated various methods of manufacturing paints and measuring their viscosity and density.

Date: July 15
Session: Afternoon
Type of Instruction: Lecture Demonstration
Instructor: Dr. Howard Decker, Executive Sect-Treas, AIAA
Topic: Happenings in Curriculum Change
Content: Spoke on the changes that are taking place in IA curriculum. Independent study conferences were conducted by Mr. Betando. Independent Study (unit development) continued.

Date: July 16
Session: Morning
Type of Instruction: Lecture Demonstration - Lab Work
Instructor: Louie Melo
Topic: Demo: Reduction of an Ore
Content: A demonstration of how an ore is reduced to a metal and how this metal might be alloyed with another metal.

Date: July 16
Session: Afternoon
Type of Instruction: Seminar - Independent Study
Instructor: Betando
Topic: Unit Development

Content: Group Discussion on Unit Development and Independent Study Conferences; more independent unit development.

Date: July 17
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Louie Melo
Topic:
Content: Lab work and demonstrations

Date: July 17
Session: Afternoon
Type of Instruction: Lecture Demonstration
Instructor: Mr. Szumski & Dr. Kemp
Topic: Single Concept Movie Development
Content: Group discussion on unit development. Demonstration showing the techniques used in the development of "Single Concept Movies".

Date: July 18
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Dave Bockman
Topic: Spectrographic Analysis
Content: Mr. Bockman discussed the theory and use of the spectrograph, and phase diagrams of low temperature alloys.

Date: July 18
Session: Afternoon
Type of Instruction: Independent Study

Date: July 19
Session: Morning
Type of Instruction: Question & Answer Session
Instructor: Louie Melo
Topic: Wood Flash and Fire Point Demo.
Content: Group discussion, followed by demonstration of material properties.

Date: July 19
Session: Afternoon
Type of Instruction: Independent Study

Date: July 22
Session: Morning
Type of Instruction: Unit Presentations
Supervisors: Mr. Hyde, Mr. Remich, Mr. Mitchell
Topic: Demonstrations in Plastics, Metals, and Woods
Content: Unit presentations by Institute participants in Union & Dartmouth Junior High Schools.

Date: July 22
Session: Afternoon
Type of Instruction: Demonstration
Instructor: Louie Melo
Topic: Demonstrations
Content: Demonstrations of fire inhibiting materials for wood products and demonstration in the use of the reflectoscope and gloss meter.

Date: July 23
Session: Morning
Type of Instruction: Unit Presentations
Supervisors: Mr. Hyde, Mr.Remich
Topic: Demonstrations; in Wood, Plastics, Metals
Content: Unit presentations by Institute participants in Union & Dartmouth Junior High Schools.

Date: July 23
Session: Afternoon
Type of Instruction: Lecture
Instructor: Ralph Bohn
Topic: Nuclear Fuels and Their Current Uses

Date: July 24
Session: Morning
Type of Instruction: Unit Presentations
Supervisors: Mr. Sellarole
Topic: Demonstrations in Wood and Plastics
Content: Unit Presentations - by Institute Participants at Overfelt High School.

Date: July 24
Session: Afternoon
Type of Instruction: Field Trip to Underwriters Lab.

Date: July 25
Session: Morning
Type of Instruction: Unit Presentations
Supervisor: Mr. Lillo
Topic: Demonstrations in Electronics
Content: Unit presentations by Institute participants at Mr. Pleasant High School.

Date: July 25
Session: Afternoon
Type of Instruction: Field Trip
Topic: Lecture at General Electric by materials scientists in the field of atomic power.

Date: July 26
Session: Morning
Type of Instruction: Demonstration
Instructor: Dave Bockman
Topic: Demonstration of materials properties
Content: Demonstration of Polaroid camera attachment for microscope.

Date: July 26
Session: Afternoon
Type of Instruction: Group Discussion
Instructor: Don Betando
Topic: School Presentations
Content: Three participants presented their Unit on Industrial Materials to the group. The remainder of the time was spent in independent study.

Date: July 29
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Louie Melo
Topic: One hour of Question and Answer time.

Date: July 29
Session: Afternoon
Type of Instruction: Demonstration
Instructor: participants
Topic: Unit Demonstrations
Content: Two groups presented their teaching units for participant evaluation. The remainder of the afternoon was spent in independent study.

Date: July 30
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Melo & Bockman
Topic: Questions & Answers
Content: One hour of questions and answers, followed by a demonstration of the use of the polaroid attachment for microscope.

Date: July 30
Session: Afternoon
Type of Instruction: Independent Study
Topic: Completion of Units

Date: July 31
Session: Morning
Type of Instruction: Lecture Demonstration
Instructor: Louie Melo
Content: One hour of questions and answers, demonstrations and lab work.

Date: July 31
Session: Afternoon
Type of Instruction: Seminar - Independent Study
Instructor: Don Betando
Topic: Evaluation
Content: Mr. Betando distributed institute evaluation forms. The participants completed unit development.

Date: August 1
Session: Morning
Type of Instruction: Examination
Instructor: Louie Melo
Topic: Final Examination

Date: August 1
Session: Afternoon
Type of Instruction: Seminar
Instructor: Ralph Bohn
Topic: Summary of Institute
Content: Dr. Bohn led a summary discussion of the Institute and a general laboratory cleanup was conducted. Final examination was returned and discussed.

Date: August 2
Session: Morning
Type of Instruction: Discussion
Instructor: Louie Melo
Topic: Discussion and lab clean-up

Date: August 2
Session: Afternoon
Type of Instruction: Closing
Instructor: staff
Topic: Closing & Departure
Content: Banquet at 17 West Restaurant, where participants were presented with certificates of attendance. Dr. Bohn, Mr. Betando, and Mr. Melo made closing comments. Institute adjourned.

Film Review

A total of 45 films were made available for participants to review during the Institute. These films covered almost every aspect of industrial materials -- from the basic structure of matter, through properties and selection of materials, to the changing of materials through nuclear action.

Films were reviewed in individual study carrels. Each carrel was equipped with a viewing surface, projector, head set, and appropriate seating and writing space. Review of films was optional. However, all participants participated, many reviewing a large number of the available films. On the average, each participant reviewed 13.4 films.

Review cards were provided and a summary of the review published for all participants. Appendix S contains a completed copy of a review card.

Study of Industrial Materials

The formal study of industrial materials was a major phase of the Institute. Essentially, teachers arrived at the Institute with a minimum educational background in industrial materials. Each morning session consisted of lecture/discussion and laboratory experiments in the properties, selection, and use of a variety of materials. The basic content of these sessions is described in the daily schedule presented on preceding pages.

The major instructional units covered:

1. State and structure of matter
2. Physical, chemical, and mechanical properties of matter
3. Metals
4. Wood and wood products
5. Fossil fuels
6. Nuclear fuels
7. Lubricants
8. Plastic materials
9. Adhesives
10. Protective and decorative materials
11. Semi-conductors, insulators, and ceramic materials

Laboratory experiments covered a wide variety of activities designed to investigate properties and uses of industrial materials. The following individual laboratory experiments were conducted during the Institute:

1. Metals
    a. Micro-examination of tension draw grains
    b. Precipitation hardening of aluminum
    c. Workhardening on mild steel during tensile testing
    d. Grain changes of bronze-rapid quench vs. slow cooling
    e. Hardening ability of low carbon steel

- f. Various quenching mediums for .70% carbon steel
- g. Grain growth vs. soaking time of .70% carbon steel
- h. High carbon steel soaked at high temps. for varying time
- i. The effect of high temperature on grain growth of eutectoid steel
- j. Microscopic esamination of arc welded mild steel specimens
- k. Microscopic examination of bronze welded steel and cast iron
- l. Microscopic examination of 50/50 solder joint
- m. Workhardening and slip-plane movement
- n. Hardness and toughness reactions of various quenching mediums
- o. Microscopic examination of silver brazed joint
- p. Surface preparation for paint adhesion tests
- q. Effectiveness of coatings on sheet metal
- r. Age hardening aluminum
- s. Tensile strength of various metals
- t. Comparative hardness of stress point and non-stressed steel
- u. Stress strain curves of various metals
- v. Corrosion of various metals in electrolyte
- w. Phase diagram development using varying amounts of tin in lead
- x. Spectrochemical analysis
- y. Demonstration of decalescence and recalescence
- z. Various pressures for powder metal composition
- aa. Thermal conductivity of metals using metal strips and paraffin
- bb. Sacrificial metal protection using 3 beakers of electrolyte
- cc. Macro-examination of metal grain flow
- dd. Elastic limit of hot rolled steel
- ee. Corrosion of copper, tin plate, galvanized plate, wood screws, and nails
- ff. Explosive qualities of metal powders
- gg. Tensile tests of annealed and precipitated alum
- hh. Wear rate of metals
- ii. Stress strain curves
- jj. Specific gravity of metals
- kk. Electrodeless nickel plating
- ll. Spectographic analysis
- mm. Effect of alloyed metals on the corrosion and oxidization of steel
- nn. The effect of carburizing and oxidizing flames on metals

2. Wood
    - a. Holding power of nails in various woods
    - b. Tensile strength of woods
    - c. Impact test of wood
    - d. Bending tests on wood
    - e. Withdraw resistance of various nails
    - f. Microscopic examination of cellular structure of various woods
    - g. Hardness test of various woods
    - h. Impact tests on various woods
    - i. Micro-examination of wood cells
    - j. Wood distortion (drying)
    - k. Bending characteristics of wood with different grain structures

- l. Abrasion tests of wood samples
- m. Wood-moisture relationship
- n. Compression of dry and wet wood
- o. Abrasive tests of surface coatings
- p. Wet and dry wood tensile strengths
- q. Finish reaction to various common substances
- r. Hardness of wood finishes
- s. Moisture absorption of woods
- t. Specific gravity test
- u. Wood distillation
- v. Wood particle compaction
- w. Wood impregnation
- x. Shock absorbtion of wood
- y. Laminated beams compared to solid beams
- z. Shear tests on woods

3. Lubricants & Fuels
   - a. Friction test of common lubricants
   - b. Comparison of lubricating qualities of new and used oils
   - c. Flash and fire point test of oils
   - d. Friction test of oil additives
   - e. Viscosity tests of standard lubricants
   - f. Viscosity tests of diluted oils
   - g. Oil additives
   - h. Reaction of lubricants to cold environments
   - i. Compare volitility of fossil fuels and powdered metals
4. Abrasives
   - a. Tensile strength of coated abrasives
   - b. Folding quailties of various backings
   - c. Grit separation by use of seives and vibration
   - d. Effect of various abrasives on wood
   - e. Testing the abrasive quality of abrasives
   - f. Comparative particle size
   - g. Grain size
5. Adhesives
   - a. Comparative tensile strength of various adhesives on wood
   - b. " shear strength of various adhesives on wood
6. Plastics
   - a. Hardness test of various plastics
   - b. Tensile tests of reinforced and non-reinforced plastic
   - c. Effects of unidirectional reinforced polyester and hardness
   - d. Effects of added heat or cooling on polymerization of polyester resin
   - e. Rise, density, and absorption quality of urethane foams
   - f. Flexibility tests of directional and non-directional reinforced plastics
   - g. Mechanical effects of fillers in polyester resins

    - h. Tensile properties of acrylic plastic
    - i. Compressive strength of rigid polyurethane foam
    - j. Flammability of rigid plastics
    - k. Cellular structure with increased heat during polymerization
    - l. Comparison of hardness of epoxy and cast polyester resins
7. Electricity
    - a. Resistance of corroded connections
    - b. The effect of temperature on wire resistance
    - c. Thermal breakdown of insulated wires
    - d. Sound carrying characteristics of solids
    - e. Conductive reactions of nichrome wire
    - f. Electrical potential and conductivity of various metals
    - g. Effects of magnetism in different conductors
    - h. Expansion of electrical wire when acting as a current carrier
    - i. The effect of work-hardening on wire conductivity
    - j. Noise elimination from wires by lubrication
8. General
    - a. Heat conductivity of various materials
    - b. Hardness and micro-examinations of various pencil leads
    - c. Crystal growth demonstration with copper sulfate or alum in water
    - d. Mark removing ability of pencil erasers
    - e. Producing colored transparencies with shelf contact paper
    - f. Wearing ability of drafting paper
    - g. Surface quality of drawing paper
    - h. Reproduction quality of translucent drawing paper
    - i. Reflectance of various painted surfaces
    - j. Tensile test of various papers
    - k. Specific gravity test on several liquids
    - l. pH test on various materials
    - m. Reactions of various materials to cold environments

Instructional Materials

The Institute also investigated the problems of teaching industrial materials in secondary school programs of industrial arts. Participants at the 1967 Institute at SJSC had developed a series of demonstration and teaching devices for use in secondary education. These devices were designed to help lower the level of abstraction by providing students with visual aids and demonstrations of the properties of industrial materials.

Each participant at the 1968 Institute was provided a copy of the report accompanying each device. These reports included drawings of the device and instructional procedures for using the device in class.

The 1968 Institute members studied this report and then focused their curriculum efforts on the development of complete instructional units for the teaching of industrial materials at the secondary level. Special emphasis was placed on the development of overhead transparencies and slides. The instructional units included unit objectives, content outlines, student activities, references, and resource materials. Transparencies were developed and offset prints were made so that each participant could prepare the transparency in his own school district. The Institute budget was not large enough to provide each participant with a copy of each of the over 200 transparencies planned for the instructional units.

The slides developed for the units presented a slightly different problem. Each person was given copies of the slides for the units he developed. All slides were then arranged for review by other participants. They ordered and paid for the duplication of the slides they wanted for their own use. A total of 2150 slides were reproduced in this manner. When requested, letters were provided each participant, identifying his personal expense. It is hoped that school districts will reimburse the teachers for this personal expense. Over 400 slides were made for use with the instructional units. Each unit having a slide presentation contained a brief description of the slides used for the presentation.

A total of 47 instructional units were developed by the participants. Appendix T contains a copy of one of the shorter units. All units were mimeographed and bound in a single volume. The offset prints from which overhead transparencies could be made were included with the units. A copy of all units, plus the film list described previously, was sent to each participant for his own use. These units may be considered a supplement to this report, but are not bound with the report due to the length of the units.

One hundred copies of the instructional units report were made for distribution. A copy was sent to each of the 1967 Institute participants. Their educational backgrounds will permit them to make valid use of the efforts of this years participants. The remaining copies will be distributed upon request to teachers and supervisors interested in improving instruction in industrial materials.

The following list of instructional units were developed:

A. Metals
   1. Adhesives for Metals - Muller
   2. Corrosion & Protection of Metals - Slowe
   3. Effect of Temperature on Wire Molecular Activity - Lucero
   4. Elastic Range of the Stress Strain Curve - Koppe
   5. Ferrous Metals - Whaley
   6. Honeycomb Metal - Velez
   7. Introduction to Cermets - Muller
   8. Introduction to Phase Diagrams - Koppe
   9. Mechanical & Physical Testing of Metals - Champagne
   10. Microscopic Examination of Joint Interfaces - Muller
   11. Non-Ferrous Metals Modifications - Champagne
   12. Relative Activity of Metals - Lucero
   13. Steel Corrosion - McAtee
   14. Structure of Metals - Whaley
   15. Thermal Conductivity of Metal - Ichikawa

B. Forest Products
  1. Adhesives in Woodworking - Woolcott
  2. Analysis of Wood as Material - McKnight & Peters
  3. Forest Products - Marich
  4. Introduction to Wood as Material - McKnight
  5. Lumbering & Lumber - McKnight & Peters
  6. Penclis - Ichikawa
  7. Properties of Wood - Hoffer
  8. Wood Abrasives - Hoffer
  9. Wood & Moisture - McKnight & Peters

C. Polymers
  1. Acrylics - Pickett
  2. Cellular Plastics - Douglas
  3. Cellulosics - Pickett
  4. Identification, Classification, & Definition of Polymers - Braco
  5. Structure and Composition of Polymers - Braco
  6. Polyesters - Douglas
  7. Properties of Polymers - Braco

D. Electronics
  1. Periodic Chart of the Elements - Slowe
  2. Semi-Conductor Materials & Doping Process - Lucero
  3. Structure of Matter - McCollum

E. Graphic Arts
  1. Chemistry of Printing Inks
  2. Strength & Durability of Paper
  3. Tensile Strength of Paper

F. Fuels & Lubricants
  1. Experiments with Lubricating Oils - Ellsworth
  2. Flash & Fire Points of Engine Motor Oils - Dickerson
  3. Fractional Distillation of Crude Oil - Barnes
  4. Obtaining Crude Petroleum - Barnes
  5. Oil Grease Lubrication Principles - Dickerson
  6. Overview of Synthetic Lubricants - Dickerson
  7. Preparation of Lithium Soap Grease - Dickerson
  8. Structure of Petroleum Hydrocarbons - Barnes
  9. Theory & Principles of Oil Lubrication - Dickerson

G. Textiles
  1. Textiles - Barden

Field Trips, Industrial Demonstrations, Guest Speakers

During the Institute, limited use was made of field trips, demonstrations and guest speakers. These include:

1. Demonstrations
  a. Audio-Visual Center, San Jose State College. Three afternoons were spent studying various techniques in planning and developing transparencies, closed loop films, slides, and other audio-visual aids and devices. These programs were conducted by Mr. Jerrold Kemp and Mr. Richard F. Szumski of the San Jose State College Audio-Visual Staff.

   - b. Understanding Materials Through Processes. Dr. Jack Chaplin, Professor, San Jose State College, demonstrated the use of a series of industrial processes devices, and their relationship to the study of industrial materials.
2. Guest Speakers
   - a. Current Trends in Industrial Arts Curriculum. Dr. Howard Decker, Executive Secretary-Treasurer, American Industrial Arts Association, presented a lecture/discussion on the evolving pattern of industrial arts curriculum.
   - b. Current Trends in Educational Media. Representatives of Brodhead Garrett Company presented their views on the uses and development of multi-media instruction.
3. Field Trips
   - a. Haveg Industries Inc., Division of American Molding Company, San Leandro. The field trip was in the area of plastic processes and emphasized the molding of thermosetting and thermoplastic polymers.
   - b. Underwriters Laboratories, Santa Clara. The field trip studied the methods used by Underwriters to test industrial materials. A tour of the Santa Clara materials testing site provided an opportunity to see many of the tests in operation.
   - c. General Electric Nuclear Reactor Division, San Jose. The study trip provided a thorough review of the nature and status of the nuclear fuel needs and use of the nation. Key General Electric research and management personnel conducted a full afternoon program for the staff and participants.

Field Testing of Instructional Units

During the fifth week of the Institute, participants field tested their instructional units in junior and senior high schools conducting industrial arts summer sessions. A total of 14 units were presented. Each participant either shared in the presentations of these units, or observed one or more of the presentations. The following teachers and schools permitted us to work with their summer students:

Mr. Hyde, Union Jr. High School, Plastics.
Mr. Mitchell, Union Jr. High School, Metals
Mr. Remich, Dartmouth Jr. High School
Mr. Sellarole, Overfelt High School, Wood
Mr. Lillo, Mt. Pleasant High School, Electronics

On Monday following the presentation, a critique was held. It consisted of a seminar type meeting of Institute members and cooperating teachers from the junior and senior high schools used. Mr. Kishbaugh, Supervisor, Union Elementary School District, also took an active part in the seminar.

The teachers also had their secondary school students prepare written evaluations of the presentations. These evaluations, the seminar meeting, and the participants self evaluation provided valuable information on the success of this program.

The following generalities were developed from this evaluation.

1. The participants covered too much content in one class period. (This was anticipated -- and permitted since we wished to make the best use of available time).
2. The students understood most of the content presented. Naturally there were exceptions. However, the majority of students indicated they understood. Also, their attentiveness and questions supported this position.
3. A few of the theoretical concepts, such as the function of a semi-conductor material in a transistor, was above the ability level of the average student. New methods must be devised to further lower the level of abstraction of these difficult concepts.
4. The demonstrations, transparencies, and slides provided the difference between poor and quality presentations. The development of effective educational media continues to be a major need of the profession.
5. The Institute participants are excellent teachers. The supervisor and administrator evaluation forms which were submitted as part of the selection process indicated that they were effective teachers. The field experience supported this evaluation.

Institute Staff

The instructional staff consisted of the following:

1. Full time faculty and assistant faculty:
    a. Louie Melo, Professor of Industrial Arts, San Jose State College
    b. Donald Betando, Associate Professor of Industrial Arts, San Jose State College
    c. David Bockman, Assistant Professor of Industrial Arts, Fresno State College
    d. Kenneth Rushing, Graduate Assistant, San Jose State College. (Industrial Arts Teacher, Denver, Colorado)

    David Bockman and Kenneth Rushing were participants in last years Institute. Their experience as former participants added a needed dimension to the faculty, and contributed to the success of the program.
2. Supporting Staff:
    a. Gary Spear, Industrial Designer
    b. Tom Kakinami, Photographer

    Gary Spear assisted the participants with planning and preparing transparencies. Many of the transparency masters were drawn and prepared for reproduction by Mr. Spear. Tom Kakinami assisted the participants with planning and taking pictures for slides. Many of the slides were photographed by Mr. Kakinami. In addition, he took numerous black and white pictures used for bringing information about the Institute to the public.
3. Secretaries

    Two secretaries were needed to provide the extensive services needed by the participants and faculty. Mrs. Susanne Hughes and Miss Patricia Carman provided the excellent secretarial services needed for a successful Institute.

An evaluation of the staff is included in the final sections where student evaluations are presented in detail. Essentially, the selection of the total Institute staff was appropriate, and everyone fulfilled their responsibilities at the expected level of performance.

EVALUATION - CONTENT AND STUDENT EVALUATION REPORTS

The formal evaluation conducted prior to the completion of the Institute consisted of a formal content evaluation, student questionnaire, and faculty evaluation.

Content Examination

A written objective examination consisting of 300 questions was administered on the opening day of the Institute and was repeated on the Thursday before termination of the program. The table on the following page shows the results of this before and after examination.

A review of the table will show that significant progress was made during the Institute. Due to a variety of backgrounds and previous learning experiences, the test scores had a wide range for both examinations. The following observations are based on the test scores:

1. All participants improved their test scores by a significant amount.
2. The wide distribution on grades on the pre-test persisted on the final test. This indicates that the wide range of backgrounds brought to the Institute also effected the progress made during the program.
3. The improvement between tests was considered very good. The exam is very difficult, and thoroughly covers the entire field of industrial materials.

The test evaluated the progress of the students in the technical knowledge phase of the Institue. None of the questions dealt with curriculum or instructional media. These aspects were evaluated by reviewing the instructional units prepared by each participant.

Participant Evaluation of Institute

Two days prior to the terminstion of the Institute, each participant was given an evaluation form which permitted an anonymous evaluation of all phases of the Institute. The form was returned on the next day. A copy of the form is included as Appendix P. The analysis of the responses is shown below.

Comments are treated as follows:

1. Comments with a frequency of one are omitted. They were reviewed and considered by the director and faculty.
2. Comments for questions 1 & 2 were integrated with the strength and weakness responses.
3. Comments for questions 3-6 were integrated with questions 7 and 8. Most, however, had a frequency of one or were a justification of the ratings assigned to the question.

TABLE 2 - BEFORE AND AFTER TEST SCORES

BEFORE TEST - JUNE 24, 1968		AFTER TEST - AUGUST 1, 1968	
RAW[1] SCORE	PERCENTAGE CORRECT	RAW[1] SCORE	PERCENTAGE CORRECT
217	73%	253	84%
212	71	241	80
209	70	240	80
202	67	234	78
200	67	230	77
198	66	228	76
194	65	228	76
190	63	224	75
185	62	222	74
185	62	221	74
183	61	216	72
180	60	215	72
177	59	209	70
177	59	208	69
175	58	208	69
175	58	205	68
175	58	203	68
174	58	200	67
171	57	193	64
161	54	191	64
161	54	190	63
141	47	182	61
139	46	170	57
129	43	160	53

MEAN:	180 -	60%	211 -	70%
MEDIAN:	178.5 -	60%	212 -	71%
MODE:	88 -	29%	93 -	31%

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[1] RAW SCORE IS BASED ON A POSSIBLE TOTAL OF 300

1. STRENGTHS AND WEAKNESSES - MORNING PROGRAM

1.1 In rank order, list the 3 phases of the morning program which you considered to be the most valuable to you.

1st ranked strength	frequency
lecture	16
demonstrations	8
laboratory	0

2nd ranked strength	frequency
demonstrations	13
lecture	8
laboratory	2

3rd ranked strength	frequency
laboratory	20
demonstrations	2

1.2 Weaknesses in the morning program

weakness	frequency
not enough lecture materials handouts	11
need better laboratory organization and general coordination	7
have required experiments and responsibilities pre-planned	
poor quality transparencies used during instruction	3
covered material too rapidly	3
not enough laboratory time	3
not enough lectures	2
no weaknesses	3

2. STRENGTHS AND WEAKNESSES - AFTERNOON PROGRAM

2.1 In rank order, list the 3 phases of the afternoon program which you considered to be the most valuable to you.

1st ranked strength	frequency
independent study	8
unit development	8
seminars	3
experiments	2

2nd ranked strength	frequency
field trip	4
film review & study carrels	4
unit development	3
small group seminars	3
seminars	3
exposure to visual aid preparation	2

2.2 Weaknesses of the afternoon program

weakness	frequency
need more direction during large group seminars	6
need more small group seminar meetings	5
demonstrations in local schools	3
local teacher evaluation not helpful	2
not enough individual contact with staff and director	2
need more direction on unit development	2
no weaknesses	2

3. FACULTY CONDUCTED PROGRAM	very good	good	fair	poor
3.1 Morning Instruction Industrial Materials Content				
3.11 Lectures	19	5	-	-
3.12 Demonstrations	15	9	-	-
3.2 Afternoon Instruction Curriculum & Instructional Materials				
3.21 Film Review and Study Carrels	10	9	5	-
3.22 Field Testing of Instructional Units	7	5	10	2
3.23 Usefulness of Instructional Units	15	7	2	-
3.24 Independent Study Conference	1	12	10	1
3.25 Trial Demos in Local Schools	6	9	8	1
3.26 Large Group Seminars	6	12	6	-
3.27 Small Group Seminars	9	14	1	-
3.28 Local Teachers Evaluation of Unit Demonstrations	3	11	7	3
3.3 Pre & Post Test	10	9	4	-
3.4 Homework Assignments	4	13	5	2
3.5 Evaluation & Grading Procedures	7	6	1	3
4. RELATED INSTRUCTIONAL PROGRAMS				
4.1 Presentation at SJSC Audio-Visual Center	21	3	-	-
4.2 Brodhead-Garrett Presentation	-	1	8	15

4.3 Presentation of Mobil Industrial Processes Teaching Devices	12	10	1	-
4.4 Field Trips				
4.41 Plastics Firm	3	13	5	1
4.42 Underwriters Lab	-	10	14	-
4.43 General Electric	24	-	-	-
5. INSTITUTE RELATED PROCEDURES				
5.1 Overall organization of course schedule	4	18	2	-
5.2 Institute Time Schedule	9	13	2	-
5.3 Housing Arrangements and handling of related problems	11	14	2	1
5.4 Social and Recreational Activities, Providing Information	18	6	-	-
5.5 Payment of Stipends	22	2	-	-
5.6 Communications and correspondence prior to Institute	24	-	-	-
5.7 Recreational Activities	17	7	-	-
6. INSTITUTE SUPPORT STAFF SERVICES OF:				
6.1 Director	15	9	1	-
6.2 Teaching Assistants				
6.21 Industrial Materials	17	8	-	-
6.22 Instructional Materials	10	14	1	-
6.23 Design Assistant	2	7	11	5
6.24 Photography Assistant	1	7	9	7
6.3 Secretarial Services	22	1	-	-

7. RECOMMENDED CHANGES FOR INSTITUTE NEXT YEAR

No definite patterns were established in response to this question. Numerous individual suggestions were provided which will help to refine future institutes. These individual suggestions included emphasis on fundamentals of materials and more rigid scheduling of activities. Some suggestions were economically impossible. For example, one person guggested that copies of all slides and overhead transparencies be given to each person. While this is desirable from an educational point of view, the cost, at $.22 per transparency and $.17 per slide, would have been over $3,000.00 -- a figure many times the instructional materials budget for the Institute.

Recommendations which had frequencies greater than one were: First three weeks should be spent on study of industrial materials, without unit development (4), organization and planning for instructional materials be directed by faculty rather than planned by Institute participants (4), and the development of instructional materials be started earlier (2).

In considering these recommendations, the first and last are opposed points of view. In last years Institute, almost all of the first two weeks were devoted to the study of materials. The evaluation indicated that the pace was too fast and should be slowed. We conclude that the problem is not critical (frequencies are low) but that it does exist. It is not possible to develop instructional units until the participants have a working knowledge of the technical subject matter. By necessity, the early study of materials involves lecture and demonstration. Six or more hours of lecture and demonstration each day in a complex technical area provides more information than a person can assimilate. As a result, neither choice - all technical study of materials at the beginning, or a combination of the technical and curriculum development is desirable. The compromise of about 2/3 materials and 1/3 curriculum (with emphasis on educational media) which was followed this summer seems to be the best compromise.

8. TENTATIVE CHANGES YOU WILL MAKE IN YOUR OWN PROGRAM.

All 24 evaluators plan to integrate industrial materials into existing programs they teach, establish industrial materials programs, modify existing instruction in light of institute experiences, or conduct inservice workshops for the teachers they supervise. This section also contained favorable comments regarding the instruction gained and the fact that much of the information could be directly applied to existing programs.

Eight paritcipants indicated they planned on conducting inservice workshops/education programs in this area. This is especially encouraging since only two supervisors were in attendance. The use of teachers in this way will provide valuable use of their training.

Director and Faculty Evaluation of Institute

Following the Institute, evaluative comments were obtained from the faculty members. These comments, coupled with the directors evaluation, are combined into the following sections.

Objectives - Primary objectives of teaching industrial materials to the participants, developing instructional and curriculum materials, and encouraging the use of new knowledge in the improvement of instruction were met. In fact, examination results. coupled with a subjective evaluation of the instructional materials indicates that the participants exceeded our expectations.

Optimum Number of Grade Levels Included - The Institute provided instruction for teachers from grades 7 - 12 and for supervisors and teacher educators. The spread was not too great. It provided for enrichment of discussion and a better understanding of secondary school industrial arts problems.

Beginning Dates - The Institute was started on June 24, one week later (on the school calendar) than last year. Three of the participants indicated their school dismissed on Friday, June 21. They had a minimum of travel time. However, the member from Puerto Rico was scheduled for return to his position on August 5. Their students are released for summer in May, and return in August. The dates used, June 24 - Aug. 2, corresponded to the regular 6 week summer session, and seem to be the best selection of available dates.

Optimum Number of Weeks - A schedule of eight weeks would have permitted more thorough accomplishment of objectives. However, staff commitments did not permit the planning of a longer Institute.

Participants - Number and Selection - The number of participants seem appropriate. Also, selection processes brought together a group of teachers having a common interest in improving instruction in industrial arts. This interest produced a cohesive group with many primary group characteristics. Since the group efforts were directed toward change and improvement of instruction, we feel that the high level of success of the Institute was due to the efforts of the paritcipants, working towards common goals.

Distribution of Time - Even though there were a few comments to the contrary, we feel the distribution of time between lecture, laboratory, group meetings, and independent study were appropriate. The comments from participants indicate individual needs, but tend to support the general belief of appropriate schedule.

Emphasis on Substantive Content vs. Teaching Skills - A small amount of time was spent on teaching skills. Actually, the only efforts were in the use and development of new educational media. The field experiences were planned to evaluate instructional content, rather than prefect teaching skills.

A major modification was made from last year's Institute in the area of curriculum development. Instructional units were planned and developed rather then teaching devices. As a result, the time spent in fabrication during the 1967 Institute was not needed. It was used to develop instructional units, transparencies, and slides, usable by everyone in attendance.

Ratio of Staff to Participants - This ratio seems appropriate. The staff was sufficiently large to provide a continuous series of learning experineces. A minimum of time was wasted in doing or repeating the work performed by others.

Budget - The budget did not provide sufficient funds to distribute free slides and transparencies to all participants. Since the distribution would have been outside the intent of NDEA Title XI, funds for this purpose were not requested.

The policy of not approving expected salary increases on the budget caused considerable effort when the salary increase was approved. The system used in 1967 proved more efficient and required less work on the part of the director.

Potential Impact of the Institute - The evaluation prepared by the participants indicates wide impact. The people in attendance were very competent. Every effort was made to encourage them to put their new knowledge into practice.

Appendix U contains a letter sent to each participants supervisor during the week following the Institute. Appendix V contains a copy of a news release which was sent to each participants local newspaper and supervisor. An appropriate photograph accompanied each news release.

General Observations. Considerable knowledge was gained from the 1967 Institute which was put to use in 1968. Changes included:

1. Slowing of depth instruction in industrial materials during first two weeks.
2. Increased efforts to establish a friendly and cohesive group. Social activities were included in the heavy schedule of the participants.
3. Curriculum development activities were changed to the preparation of instructional units, including planning of educational media.
4. A field testing experience was conducted during the fifth week.
5. Increased instruction in the use and preparation of educational aids, such as overhead transparencies, slides, and closed loop films.

The faculty believes that the Institute was a success. In retrospect, we see things which could have been improved. However, we would not want to modify the Institute results. The teachers, supervisors, and teacher educators seemed well educated, and motivated to improve instruction through dynamic content and method changes.

STATISTICAL REPORT

The statistical report furnished by the Measurement Research Center of Iowa is included as Appendix Q.

CONCLUSIONS

In the estimation of the director and instructional staff, the Institute accomplished the planned objectives. The teachers, supervisors, and teacher educators in attendance gained considerable knowledge about industrial materials, and the study of industrial materials as an integrated part of industrial arts. More specifically accomplishments included:

1. Increased technical knowledge - Each participant demonstrated a significant increase in knowledge regarding the structure, properties, and industrial use of industrial materials. This knowledge was measured by a before and after objective examination, and by the subjective evaluation of the staff. The growth measured on the examination was evident when the participants field tested their instructional units. They made excellent presentations which were technically accurate and used the most current educational media.

2. Developed instructional units with appropriate transparencies and slides - Considerable progress was made in preparing instructional units which could be used in secondary and collegiate programs of industrial arts. These units included overhead transparencies, slides, student activities, and thorough outlines of content being presented.

3. Gained knowledge in the preparation and use of new types of educational media - Even though only a minor objective of the program, considerable knowledge was gained from brief instruction in these areas.

4. Knowledge on ability of secondary school students to understand technical information on industrial materials - Field testing of instructional units provided initial information on the ability of secondary school students to profit from instruction in industrial materials.

5. Impact and dissemination of information - Participants represented many different parts of the country, thereby taking the knowledge back to their own districts. Many indicated they planned to conduct inservice education programs and/or encourage other teachers to update instruction through the integration of industrial materials.

The objectives of the Institute were accomplished by the combined efforts of faculty and participants. The faculty planned an agressive program, but continually discussed content and procedures with the participants. Every effort was made to conduct a cooperative program. A major aspect of success is the acceptance of instruction by the participants. Suggestions for changes were accepted and incorporated whenever possible. As a result, faculty, staff and participants worked long hours but were able to identify progress and accomplishment. This produced an overall recognition of the need for change and improvement -- with those in attendance being a major vehicle in producing the change.

A review of both participant and staff evaluations indicates that both groups felt the Institute was a success, and the time and money well spent. Numerous suggestions for improving future programs were made. The faculty will make use of these suggestions just as last years suggestions were used to modify and improve the 1968 Institute.

APPENDICES

APPENDIX A

Information Contained in Institute Brochure.
The actual brochure was a
17" x 9" release, folded to 8 1/2" x 4 1/2"

THE PROGRAM

Organized instruction in the composition, physical and mechanical properties, and modification and selection of industrial materials is emerging as an important aspect of secondary school industrial arts. As a result, teachers are beginning to include instructional units on industrial materials in existing programs.

Teachers who have included this instruction have identified a need for both an organized study of materials (properties, selection in terms of working environments and modification to meet particular needs) and information on the methods and procedures whereby instruction on industrial materials can be effectively integrated into existing instructional programs.

Based on these needs, instruction will be divided into four phases:

PHASE 1. Technological Study of Industrial Materials

PHASE 2. Integration of Industrial Materials into Existing Industrial Arts Programs

PHASE 3. Field Experience in Teaching Industrial Materials

PHASE 4. Instructional Media

Instructional units included in Phase I will be:
- *General chemical structure of common industrial materials.
- *Physical and mechanical properties as they apply to problem solving.
- *Unit studies of the following major material families:
  - Metals
  - Wood and wood products
  - Fuels and lubricants
  - Plastics (polymers)
  - Adhesives
  - Protective and decorative coatings
  - Other materials - such as cements, natural earth materials, etc.

Phase 2 will put into use the technical instruction of Phase I. Instructional units, applicable to secondary school or teacher training programs, will be developed through seminar and laboratory activities.

Phase 3 will field test the instructional units developed in phase 2. Teachers in attendance will field test their instructional units on secondary school students attending local summer sessions.

Phase 4 will provide general instruction on new developments in instructional media, including the systems approach to instruction, instructional TV, closed loop films, etc.

The entire program will consist of both classroom and laboratory activities. The program will be conducted from 8:00 am to 4:00 pm daily, with appropriate breaks and lunch period.

A reasonable amount of outside study and planning will be required. The schedule will be modified to accommodate study trips, guest lectures, and field experiences.

TEXTBOOK: Lawrence H. Van Vlack, Elements of Materials Science, Addison-Wesley Pub., Co., 1964. In addition, special reference books will be required. Each participant should plan on spending $15 - $20 for study and reference materials.

COURSE NUMBER AND TITLE: Industrial Arts 115S - Industrial Materials as an Integrated Part of the Industrial Arts.

CREDIT: Six units of upper division or graduate credit will be provided upon request.

INSTITUTE STAFF

DIRECTOR: Ralph C. Bohn, Chairman and Professor, Department of Industrial Studies, San Jose State College. Guest summer faculty member in industrial materials at Colorado State College and Arizona State University. President, American Industrial Arts Association.

ASSOCIATE DIRECTOR: Louie Melo, Professor of Industrial Studies, San Jose State College. Author of numerous articles on industrial materials. Presentations on industrial materials at American Industrial Arts Association, American Vocational Association, California Industrial Education Association, and Oregon Industrial Education Association.

FACULTY: Donald J. Betando, Associate Professor of Industrial Studies, San Jose State College. College teaching experience in curriculum, wood, metals, plastics, and educational media. Guest faculty, 1967 NDEA Title XI Institutes in Industrial Arts at the University of North Dakota and Chico State College.

David Bockman, Assistant Professor of Industrial Arts and Technology Fresno State College. College teaching experience in industrial materials, metals, woods, and machine metalworking. Participant, NDEA Title XI Institute in Industrial Materials, San Jose State College, Summer, 1967.

FACILITIES

The Institute will use the extensive facilities of the Industrial Studies Department at San Jose State College. Facilities which will be used include: industrial materials laboratory, woodworking laboratory, metalworking laboratory, general purpose classroom, and library facilities.

ELIGIBILITY

Applicants must meet the following requirements:

*Three years teaching and/or supervisory experience as an industrial arts teacher (grades 7-12), supervisor, or teacher educator.

*Teaching area of drafting, metals, woods, plastics, auto and power, graphic arts, electricity/electronics, or a combination of these areas.

*Bachelor's or Master's degree with a major in industrial arts (verified by college transcripts).

*Contract or agreement to continue, during 1968-1969, teaching industrial arts in grades 7-12, supervision, or teacher education requiring a knowledge of industrial materials.

*One year of college chemistry, including organic and inorganic chemistry. This requirement may be met by verified experience or self-study.

*Written recommendation of immediate supervisor (school principal or superintendant). This recommendation must indicate that the participating teacher will be encouraged to use institute experiences.

*Submission of a statement describing interest in industrial materials and its relationship to industiral arts instruction, and interest and reason for participation in the institute.

Before making an application for this institute, make certain you meet the eligibility requirements listed above, and will be able to supply the necessary recommendations and statements. Appropriate forms will be sent upon receipt of the "Request for Application Forms" attached to this brochure.

NON-DISCRIMINATION CLAUSE

San Jose State College does not discriminate on basis of race, color, creed, sex, or national origin.

SUBMISSION, NOTIFICATION, AND ARRIVAL DATES

*March 17, 1968: postmark deadline for submission of application, letters of recommendation, and transcript. In meeting this deadline plan on receiving application forms ten days after submitting the attached "Request for Application Forms".

*April 5-12, 1968: notification of selection of participants and alternates.

*April 21, 1968: postmark deadline for acceptance of position as participant or alternate.

*June 23, 1968: latest date for arrival at San Jose State College for participation in Institute.

STIPENDS

Participants will be eligible to receive, upon application, stipends of $75.00 per week, plus an allowance of $15.00 per week for each dependent during the six week period of the Institute. Stipends will be paid on the following schedule: four weeks of stipend allowance on June 28, remaining two weeks on August 2. There will be no tuition or laboratory fee charged to participants.

Travel to San Jose is at the participants' own expense. Cost of room, board, and incidental expenses will be paid by the participants. No costs or expense will be deducted from stipends.

HOUSING

College dormitory housing will be available for single and married participants, including older children (over 10 years). The dormitories are seven years old, air conditioned, modestly furnished, clean and well maintained. Young children are discouraged since there are no recreational facilities for them in the dormitories.

Dormitory rates per person for Six Weeks Institute

Single Occupancy.	$72.00
Double Occupancy.	$60.00 each

Meals may be purchased from the college cafeteria. Cost depends on purchase and normally averages $3.50 per person per day. Blankets and towels are available at a cost of $1.00 per week.

For families with young children and others desiring private bath and cooking facilities, private apartments close to campus are available. These apartments have one, two or three bedrooms and are modestly furnished. Some have swimming pools. A list of private apartments, including rates, will be provided each person with their "notice of selection" during the week of April 5-12,1968. Rates will range from $185-$250 for the six week institute. Since all apartment housing is privately owned, the college and departmental responsibility to the participant can only be to advise and assist with housing arrangements.

INFORMATION OF INTEREST

The college summer Festival of Arts and other campus cultural and recreational activities will be available to participants and families.

San Jose is located in an excellent recreational area. The college is 30 miles from the Pacific Ocean, 20 minutes from mountains and camping facilities, and 50 miles from San Francisco. The summer climate is dry with moderate temperatures! Evenings are cool.

- -

REQUEST FOR APPLICATION FORMS

NDEA INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS
INDUSTRIAL MATERIALS - SAN JOSE STATE COLLEGE

Name______________________________________Home Phone__________

Address____

____Zip______

School Name and Address____

____Zip______

Teaching Area_______________Position or Title_________________

Return this request to:
RALPH C. BOHN, DIRECTOR
NDEA Institute for Advanced
Study in Industrial Arts
San Jose State College
San Jose, California 95114

Application forms will be forwarded to you upon receipt of this request form. All application forms, letters of recommendation and transcripts must be postmarked by March 17, 1968.

APPENDIX B

Copy of letter accompanying the application packet

Dear

Thank you for your interest in the NDEA Institute for Advanced Study in Industrial Arts at San Jose State College. This application packet contains the necessary forms and instructions for completing your application.

In order to apply, please do the following:

1. Send a copy of your transcripts or have a set forwarded by your college or university. The transcripts must show that you have received a Bachelor's and/or Master's degree with a major in industrial arts. Since this institute has a college chemistry requirement, the transcripts should show these courses, unless you provide information on Item 29 of the Supplement to the Application for Admission form showing the equivalent of college chemistry. The transcripts must be forwarded directly to me.
2. Complete the Application for Admission (Form OE 4401) with the attached San Jose State Supplement, and the Applicant Record Card (Form OE 4402). These should be mailed in one of the return envelopes provided.
3. Have your chief school administrator, preferably the school principal, or, in the case of college faculty, the department chairman or dean, complete the attached Confidential Evaluation Form (Form OE 4403). This form should be mailed by the person completing the form. A self addressed, stamped envelope is provided for his use.

All transcripts and forms must be completed and postmarked by March 17, 1968.

For your convenience, a copy of the institute brochure has been included. Please review the section describing eligibility requirements as well as submission and notification deadlines.

Sincerely,

Ralph C. Bohn
Director

Enclosures:
1. Application for Admission (OE4401) with San Jose State Supplement
2. Application Record Card (OE4402)
3. Confidential Evaluation Form (OE4403)
4. Two return envelopes
5. Institute brochure

APPENDIX C

Copy of Special Supplement to Institute Application (Since the application is a standard government form, a copy was not included in the appendices.)

APPLICATION FOR ADMISSION

(San Jose State Supplement)

29. Have you successfully completed one year of college chemistry?

_____yes _____no

If no, please indicate experience or nature and type of self study you have completed in lieu of college chemistry. Please indicate when your experience or self study took place.

30. In the space below, briefly describe your interest in attending this institute and studying industrial materials. Please include how this study will help your present teaching or supervisory position, and the use you hope to make of this instruction.

APPENDIX D

Copy of letter sent to each applicant who didn't have his application completed by one week prior to the deadline.

Dear

We have checked our files and find that your application for the NDEA Title XI Institute in Industrial Arts at San Jose State College is not complete.

The checked items listed below were missing at the time this letter was sent. It is possible that this letter and the item checked passed in the mail. We wanted to take this means of letting you know that the checked items were not on hand so that you might make the necessary follow-up.

____ Form OE 4403 - Confidential Evaluation Form. To be filled out by your industrial arts supervisor or shcool principal. An additional copy enclosed.

____ Form OE 4402 - Applicant Record Card. Additional card enclosed.

____ Transcript showing your Industrial Arts Degree, and chemistry - if completed in college.

____ Form OE 4401 - Application for Admission. We have received some materials from you but not an application form. If you are interested in applying, please complete the enclosed application form and any other materials checked on this letter.

____ San Jose State College Supplement to Application for Admission. An additional copy is enclosed.

If you are not interested in completing your application for the Institute, or if we received some materials for you in error, it is not necessary to reply to this letter. If you wish any materials returned to you, please let me know.

All application material, including transcript, must be postmarked by March 17, 1968. This is a U. S. Office of Education regulation for NDEA Title XI Institutes. Your cooperation is appreciated.

Sincerely yours,

Ralph C. Bohn
Director

APPENDIX E

Copy of letter sent to applicants ineligible due to previous institute attendance

Dear

Thank you for your interest in the NDEA Institute for Advanced Study in Industrial Arts which will be held at San Jose State College during the coming summer.

It is with regret that we inform you that a ruling is in effect that makes an applicant who has previously attended an NDEA Institute in the area of Industrial Arts ineligible to attend a second institute in Industrial Arts. This is to enable a greater number of teachers to participate in this highly selective program.

We sincerely hope you will find other means to further your professional study in industrial arts during the coming summer. Best wishes for continued success in industrial arts teaching.

Sincerely,

Ralph C. Bohn
Director

APPENDIX F

Copy of Identification Slip attached to each Application to aid Identification

1. Name ____

2. City-State-Zip Code ______________________________

3. Papers Received:

   Application (4401) ____

   SJSC Supplement ____

   Transcripts ____

   Record Card (4402) ____

   Evaluation ____

4. a. BA or BS with major in industrial arts ____

   b. MA or MS with major in industrial arts ____

5. a. Completed one year college chemistry - verified ____

   b. Grades

6. a. Overall GPA if listed ____

   b. Estimated GPA if not listed ____

7. Previously attended NDEA institute ____

8. Teaching level:

   ____ Junior High

   ____ Senior High

   ____ Teacher Educator

   ____ Supervisor

   ____ Other (list)

   ____

9. Subject area (s) currently teaching:

   ____ Metals (Machine Shop)

   ____ Wood

   ____ Auto (Power Mach.-Transportation)

   ____ Electricity/Electronics

   ____ Graphic Arts

   ____ Drawing/Drafting

   ____ General Shop

   ____ Other (list)

   ____

   ____

APPENDIX G

Copy of letter to the Applicants Selected to attend the Institute

Dear

It is a pleasure to inform you that our NDEA Evaluation Committee has selected you as a participant in the NDEA Title XI Institute for Advanced Study in Industrial Arts to be held at San Jose State College from June 24 to August 2, 1968. You are one of twenty-four junior high teachers, senior high teachers, teacher educators, and supervisors selected from over 400 applicants. It is our belief that you will be an asset to the program and profit from the instruction and professional exchange of knowledge and ideas.

We hope that you will be able to accept this invitation. Acceptance will obligate you to devote your full efforts to the work of the Institute. Classes will be conducted from 8:00 am to 4:00 pm, Monday through Friday during the six week period. Outside reading and study will be a necessary part of the program. Consequently, you will not have time to carry on outside work or take other courses. If you accept and attend, you will be eligible to receive a stipend of $75/week plus $15/week for each dependent. We will expect you to arrive at the College no later than Sunday, June 23, 1968.

If you plan to accept appointment as a participant in this institute, the following three items must be completed and mailed no later than April 21, 1968.

1. Certificate of Acceptance
2. Application for Stipend Form (OE 4404)
3. Oath or Affirmation Form (OE 4405) completed and duly notarized.

These three items are enclosed and should be completed and returned using the enclosed envelope. Unless these instructions are followed precisely, your name will be dropped automatically from the list of institute enrollees on the morning of May 2, 1968, and a replacement selected from the waiting list of alternate candidates.

Housing information will be forwarded to you after receipt of your acceptance. It will not be necessary for you to live on campus. However, commuting distances of more than 15 miles will require prior approval of the Institute Director. Individual and family housing will be available on campus at either campus dormitories or private apartments.

We look forward to having you join us on this cooperative experience in the study of Industrial Materials.

Sincerely,

Ralph C. Bohn
Director

Enclosures:

1. Certificate of Acceptance
2. Application for Stipend Form (OE 4404)
3. Oath or Affirmation Form (OE 4405)
4. Return Envelope

NDEA INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL MATERIALS

CERTIFICATE OF ACCEPTANCE

I accept your invitation to attend the NDEA Institute for Advanced Study in Industrial Materials at San Jose State College. I will arrive at the College ready to begin study no later than Sunday, June 23, 1968.

I understand that I will pay no fees or tuition, but must pay for transportation, room and board, books and supplies. I am eligible to receive a stimend of $75.00/week plus $15.00/week for each dependent.

Date ____________________ Signature ____________________

I find it impossible to accept your invitation at this time. I would like to:

☐ Be considered if there are subsequent NDEA Institutes for Industrial Arts at San Jose State College.

☐ Inform you that I have been accepted for and will attend an NDEA Institute at: ____________________

☐ Other: ____________________

Date ____________________ Signature ____________________

Return to:
Ralph C. Bohn, Director
NDEA Institute in Industrial Materials
San Jose State College
San Jose, California 95114

This Certificate must be postmarked on or before April 21, 1968 in order to participate.

APPENDIX H

Copy of letter to Applicants Selected as Alternates

Dear

Our Evaluation Committee for selecting participants for the NDEA Institute in Industrial Arts at San Jose State College has selected you as an alternate participant. You are among twenty-four alternates whom we are asking to stand by in the event any of the selected twenty-four participants decline the invitation to attend the Institute. Since application to more than one NDEA Institute was permitted, we expect a number of those selected will be unable to participate in our program.

Selected participants have until April 21, 1968 to officially accept the invitation. On or after May 2, we will select alternates to replace those unable to attend.

We received over 400 application for the Institute and selecting twenty-four participants from the large number of eligible applicants was extremely difficult.

Best wishes for continued success in industrial arts teaching.

Sincerely,

Ralph C. Bohn
Director
NDEA Institute in Industrial Arts

APPENDIX I

Copy of letter to Applicants Not Accepted

Dear

Thank you for your interest in the NDEA Institute for Advanced Study in Industrial Materials which will be held at San Jose State College during the coming summer. It is with regret that we inform you that you were not one of those selected to participate.

We received hundreds of applications from industrial arts teachers from all parts of the United States. The selection of 24 participants was very difficult, since nearly all applicants were well qualified and able to profit from the planned program.

We sincerely hope you will find other means to enrich your professional preparation in industrial arts during the coming summer. San Jose State College offers a regular summer session graduate program in industrial arts. If you are interested in receiving further information about this program, please write.

Best wishes for continued success in industrial arts teaching.

Sincerely,

Ralph C. Bohn
Director

APPENDIX J

List of Participants, their home addresses, teaching areas, and school addresses

Hugh C. Barden
1236 East 54th Street
Tacoma, Washington 98404
Junior High
General Shop
Hunt Junior High School
6501 South 10th Street
Tacoma, Washington 98466

Roger L. Barnes
1210 Alexander Highway
Colorado Springs, Colorado 80909
Junior High
General Shop
Horace Mann Jr. High School
1001 East Van Buren
Colorado Springs, Colorado 80907

Joseph Braco
263 East 7th Street
Oswego, New York 13126
Teacher Educator
Metals
State University of New York
College at Oswego
Oswego, New York 13126

Wilcy J. Champagne
495 West Magnolia
Ponchatoula, Louisiana 70454
Teacher Educator
Metals
Southeastern Louisiana College
College Station
Hammond, Louisiana 70401

William Velez Cuevas
Ave. Apolo EEI
Reparto Apolo
Guaynabo, Puerto Rico 00657
Supervisor
Industrial Arts Education
Oficina Regional de San Juan
Avenida Barbosa Esquina Calle Guayama
5to. Piso Edificio Barreras
Hato Rey, Puerto Rico 00917

L. Wayne Dickerson
1709 North Sixth
Garden City, Kansas 67846
Senior High
Auto
Garden City Senior High
Garden City,
Kansas

Wayne A. Douglas
5882 Horning Road
Kent, Ohio 44240
Senior High
Drawing
Central High School
123 South Forge Street
Akron, Ohio

Ned. M. Ellsworth
1347 East Apache Blvd. #73
Tempe, Arizona
Senior High
Wood
Cortez High School
8828 North 31st Avenue
Phoenix, Arizona 85021

John J. Gedker

Printing Department
Division of Industrial-Technical Education
Fairmont State College
Fairmont
West Virginia

Robert C. Hoffer
1013 Kings Street
Chowchilla, California 93610
Jr - Sr High
Wood
Chowchilla Union High
P.O.Box 997
901 Humboldt Street
Chowchilla, California 93610

Buster K. Ichikawa
1340 South Clover Avenue
San Jose, California 95128
Junior High
Metals
Roosevelt Jr. High School
901 East Santa Clara Street
San Jose, California 95116

Lothar W. Koppe
643 A Taravel
San Francisco, California 94116
Teacher Educator
Metals
San Francisco State College
1600 Holloway Avenue
San Francisco, California 94132

Austin E. Lucero
4852 Kinghurst Drive
San Jose, California 95124
Senior High
Electronics
Adrian Wilcox High School
3250 Monroe Street
Santa Clara, California 95051

Willard R. McAtee
6488 Little Falls Drive
San Jose, California 95120
Senior High
Metals
Pioneer High School
1290 Blossom Hill Road
San Jose, California 95118

John C. McCollum
13290 Pierce Road
Saratoga, California 95070
Senior High
Electricity/Electronics
Homestead High School
Box F
Sunnyvale, California

Thayne McKnight
3446 South Forest
Denver, Colorado 80222
Junior High
Wood
Grant Junior High School
1751 South Washington
Denver Colorado

Stanley Marich
2423 Denevi Drive
San Jose, California 95130
Junior High
General Shop
Jefferson Intermediate School
3585 Monroe Street
Santa Clara, California

Arthur E. Muller
RFD #5
Menomonie, Wisconsin 54751
Teacher Educator
Metals
Stout State University
Menomonie
Wisconsin 54751

James R. Peters
1498 Darryl Drive
San Jose, California 95130
Junior High
Wood
Caroline Davis Jr. High
5035 Edenview Drive
San Jose, California

L. Russell Pickett
2320 Laura Street
Springfield, Oregon 97477
Junior High
General Shop
Hamlin Junior High School
525 Mill Street
Springfield, Oregon 97477

Jerald W. Schoenike
3029 South 18th Street
Sheboygan, Wisconsin 53081
Supervisor
Sheboygan Public Schools
830 Virginia Avenue
Sheboygan, Wisconsin 53081

Alfred J. Slowe
30 Prince Street
North Attleboro, Massachusetts 02760
Senior High
Drawing
North Attleboro High School
45 South Washington Street
North Attleboro, Massachusetts 02760

Donald C. Whaley
114 South Edgewood Drive
Statesboro, Georgia 30458
Teacher Educator
Metals
Georgia Southern College
Division of Industrial Technology
Statesboro, Georgia 30458

Earl E. Woolcott
1706 West Longmeadow
Trenton, Michigan 48183
Junior High
General Shop
Slocum Truax Junior High
2340 Third STreet
Trenton, Michigan

APPENDIX K

Copy of Follow up letter to Alternates prior to start of the Summer Session

Dear Industrial Arts Teacher:

At the present time, the 24 participants in the NDEA Title XI Institute in Industrial Arts at San Jose State College have been selected and have accepted. As a result, we do not anticipate having any additional positions available for the present institute.

Naturally, it is possible that due to a change of assignment or for personal reasons, someone mow planning on attending the institute might have to drop out. In this case, we would return to our alternate list and contact people by telephone to determine whether they could attend. We do not, however, feel that you should plan on this procedure and that you should feel free in making personal plans for the coming summer.

Sincerely,

Ralph C. Bohn
Director

APPENDIX L

Copy of Housing Letter sent to all Participants

Dear NDEA Institute Participant:

Our class of 24 is about complete and we will soon send a list of everyone who will be in attendance to each of you. This memo contains the housing information which we promised we would forward to you.

Due to the increased interest rates and difficulty in obtaining housing loans, apartments have become scarce in the San Jose area. We therefore encourage you to act promptly on your housing needs. The following are available for your consideration:

SUSAN APARTMENTS at 442-444 South Fifth Street

This is an apartment building about six blocks from the Industrial Studies Building. It consists of approximately 15 apartments. Each apartment has two bedrooms, 1 bath, a living room and a kitchen. Our general evaluation is that they are typical campus housing, clean, paritally carpeted and adequately furnished for a couple with one or two children. The owner has agreed, however, to accept three children provided one of them is an infant, with a stipulation that you provide your own crib. The cost for the six weeks summer session will be $120 per couple plus approximately $15 extra for each additional person. A security deposit of $25 per person is required.

In order to obtain housing at this apartment, you should contact Mr. S. Meyerson, 1823 Comstock Lane, San Jose, California, telephone (408) 269-8384.

JO MAR APARTMENTS at 467 South Eighth Street

This apartment is three and a half blocks from the Industrial Studies Building. They have one two-bedroom and five three-bedroom apartments available. The managers indicated that they would hold them for us until May 7. Each apartment has 2 baths, a living room and a kitchen. These apartments are slightly larger than the one listed above with some additional storage space. However, in the subjective judgment of those visiting the apartments, they are not quite as nice as the ones listed below. The cost for the six weeks will be as follows:

a. Two-bedroom apartment -- $165 for 2 people, plus $15 for each additional person up to 4.

b. Three-bedroom apartment -- $190 for 2 people, plus $7.50 for each additional person.

c. A security deposit of $40 plus $1 for each key is required.

Apartments will be checked prior to your departure against a check list filled out by you when you arrive.

In order to obtain housing at this apartment, please contact Mr. or Mrs. Argabright, 647 South Eighth Street, #1, San Jose, California 95114, telephone (408) 297-8640.

LYNN HALL at 642 South Seventh Street and GRANT HALL at 598 South Ninth Street.
These two apartment buildings are owned by Killion Enterprise and located within reasonable walking distance of the campus. Each contains a number of both two- and three-bedroom apartments, and they are somewhat better than typical campus housing -- but by no means luxurious. Each apartment has two baths, a living room and a kitchen. Some have studies. These are probably among the largest apartments in the immediate area and are clean and well kept up. Lynn Hall is located across the street from a playground, and Grant Hall is only two short blocks away from the same playground.

The owner has not yet indicated what the exact cost of these apartments will be for the summer six-week period. However, they will probably run in the general area of $230 to $290, plus a security deposit of $20 per person which is only partially refundable under rigid conditions.

In order to obtain housing in one of these apartments, contact Mr. or Mr. James Killion, P. O. Box 1609, San Jose, California, with a carbon copy to one of the following:

Grant Hall: Mrs. Charles T. Redman
598 South Ninth Street, #1
San Jose, California 95112

Lynn Hall: Mrs. John R. Schmitt
642 South Seventh Street, #1
San Jose, California 95112

SYCAMORE TERRACE at 357 East San Fernando Street
This apartment building is located across the street from the Industrial Studies Building. These apartments consist of 1 bedroom, 1 bath, a living room and a kitchen. Because children are not permitted to live in the complex, we recommend these only for those who have no children or who are not bringing any children with them. They may be described as clean, attractive and quite adequate for a couple. The cost for the six weeks will be $187.50, plus a $25 security deposit.

In order to obtain housing at this apartment, contact Mr. Pieracci, 357 East San Fernando, San Jose, California 95114, Telephone (408) 258-7554.

RESIDENCE HALL HOUSING

These residence halls are owned and under the supervision of the State College. As mentioned in the brochure, the residence halls are air conditioned but have no facilities for cooking or private baths. They are only a few years old and might be best described as typical college dormitories. All meals must be taken in the college cafeteria, where the cost will run between $3 to $4 per day. The residence halls do not require a security deposit. Children are welcome but all assignments will be made on a basis of one or two persons per room. From past experience, the college has found that children under ten years of age find the residence halls somewhat confining, since there are no play areas or activities suitable for the young. If you have small children we recommend one of the first three apartments listed above. Single people and married couples find the residence halls adequate for their needs, provided they are willing to take all meals out and share bath facilities.

An application form for the residence hall is enclosed.

MOBILE HOME PARKS

There are a number of mobile home parks within reasonable commuting distance of campus. There are none, however, that are within walking distance of campus. California is a popular place for people to spend their summer vacations. As a result the mobile home parks will not take prior reservations, but operate on a first-come, first-serve basis. Last year one person brought his mobile home and was fortunate in obtaining a place in a very nice park close to campus. However, friends who visited me last year were not as fortunate and found a rather inadequate spot some 20 miles from San Jose as the only available site.

There are no camping facilities within commuting distance of the college. There are, however, numerous camping facilities in the area for weekend use or for vacationing before or after the institute.

We will be glad to give you any help that you might need. We suggest that you plan to arrive on campus on Saturday, June 22. This will give you time to get settled and be ready for the start of the institute on Monday. There will be an informal get-together on Sunday -- more about that at a later date.

Just a brief note on security deposits: Many apartments use the security deposit money for cleaning and other activities. From past experience we suggest you not anticipate full return of the deposit. In fact, an appropriate attitude is to expect none and then be pleasantly surprised with a return of a partial deposit -- provided you are so fortunate. We have discussed the deposit with all the apartments mentioned and are quite hopeful that you will be treated fairly.

We would also like to remind you that the security deposit is required in advance to hold any of the above apartments for you.

As time goes on, we will be forwarding more information regarding our geographical area and our program for you. In the meantime, we have enclosed a sheet on which you can list questions, and return it in the enclosed envelope. We will bring all the questions and prepare a duplicated release so that all may profit from the specific questions you may have (we won't identify the source of the questions).

Again, please make early arrangements for your housing. We are looking forward to having you with us this summer.

Sincerely yours,

Ralph C. Bohn
Director

Enclosures:
- Dormitory application form
- Question sheet
- Return Envelope

Copies to all Institute and staff members

APPENDIX M

Copy of Curriculum and Basic Information Letter Sent to All Participants

Dear Industrial Arts Educator:

We are in the process of making final arrangements for this summer and would like to provide you with further information regarding your attendance at San Jose State College.

Housing. Please complete your plans soon - if you haven't already done so. If we can help, please let us know by either telephone or return mail. (You should have received our housing letter two weeks ago - if you haven't received it, let us know.)

Teaching Units - Testing Devices. Last summer, teachers attending the Institute constructed a series of testing devices which could be used in the typical secondary laboratory. They prepared brief units and descriptive information on each device. A copy of the write-up accompanying each device is being sent to you under separate cover. Please review this material at your leisure (or when you're busy), and bring it to San Jose with you.

This year, we will try to continue on where the last group left off. Essentially, our program will be divided into 2 main segments. Two additional (minor) segments will be added to complement the first two. The 2 main program segments followed by the 2 minor segments are listed below:

A. MAJOR

1. Study of Industrial Materials. Each morning you will meet with Louie Melo and Dave Bockman on an organized study of industrial materials. This program will consist of lecture, discussion, and laboratory materials demonstrations covering the broad range of industrial materials, from physical properties, through woods, metals, plastics, etc, to coatings and adhesives. Laboratory experiments will be completed in all areas - with a concentration in your area of interest.

2. Instructional Materials. Each afternoon you will work with Don Betando and Ralph Bohn on the problems of implementing instruction of industrial materials in junior and senior high school. We will freely use last years materials, improving upon them, developing new devices, and completing full instructional units. Some of the questions we will pursue include:

a. What industrial materials instruction is significant and needed for junior high --- for senior high --- in metals --- in wood --- in plastics --- in adhesives --- in coatings --- etc?

b. What should each instruction unit contain (teaching aids, overhead transparencies, slides, student testing devices, planned experiments, examinations, closed loop films, etc?)

Once (a) and (b) are reviewed in total class and small group discussion, we will proceed to make as many of the materials for the teaching unit as time will permit. Information on everyone's work will be made available to the entire class.

B. MINOR

1. Field Testing of Completed Units. Instructional units completed in item 2 above will be field tested in secondary schools operating summer programs in industrial arts. Not all units will be tested, because of the shortage of time. We will however, gain information on student ability to master instruction and weaknesses in those units tested.

2. Preparation and Review of Available Audio-Visual Aids. Instruction on preparing visual presentations will be included during the Institute. Also, most films available in this area have been ordered for review. Review will be optional since it can be very time consuming. Audio-visual facilities will be available each weekday evening, on an optional basis.

Fourth of July Weekend. July 4 falls on a Thursday this year. School will be closed on July 4 and in session on Friday, July 5. Since we will have a large number of people at the Institute from schools outside of California, we are planning a program modification to provide a four day weekend. We will meet on Saturday, June 29 instead of Friday, July 5. You will then be free from Wednesday evening (July 3) to Monday morning (July 8).

We will make this change unless we hear from one or more participants that for religious reasons, you can't attend school on Saturday. Also, if a reasonable number do not like the change, we will operate on the regular summer session schedule. Changes of this type normally require full cooperation and agreement of the entire class. If you can't attend on Saturday, June 29, or prefer not to attend, please let us know by return mail. In this case, silence will mean agreement with the proposed change.

Barbecue, Sunday, June 23. Each Institute member, plus faculty and supporting staff are invited to my home for a "Hamburger barbecue" to get acquainted. Please bring your families, including the children. We realize that many of you will want to get settled in your new living quarters, so plan on eating and staying only as long as you like. More details, including maps, will follow at a later date.

Additional Mailings. You can expect to receive a number of additional mailings from us. Louie Melo is planning on sending you a copy of presentation made at the 1968 AIAA Convention in Minneapolis. Also, a number of you have asked questions on the sheet provided with the housing information. I'll wait till next week to permit others to come in - and then answer them all in a single report.

The weather is a pleasant 75° F, with a clear sky. I hope we have it all summer.

Sincerely,

Ralph Bohn
Director

APPENDIX N

Copy of Question and Answer Report Sent to all Participants

MEMORANDUM

TO: Industrial Arts Teachers

FROM: Ralph C. Bohn, Director

SUBJECT: Question and Answer Report

A number of you took the opportunity to ask questions regarding specific details on the Institute program, housing, recreations, etc. Rather than write individual letters, this one duplicated release will provide the answers to all the questions. In this way, each of you can profit by the questions raised by others. The questions are not presented in any particular order or grouping.

1. If living in the residence hall, do all meals have to be taken at the college cafeteria?
   Reply: No. Meals taken in the cafeteria will be paid for as purchased. There is no financial arrangement between the dormitories and cafeteria. You will be free to eat where you wish and when you wish. The cafeteria, however, will be available to you.

2. Is it permissable to keep some foods in the residence halls to be eaten there?
   Reply: Some food may be kept in your room. There are vending machines located in each dorm which provide soft drinks, coffee, etc. There is no community kitchen or kitchenette and cooking is not permitted in the dorm.

3. What college recreational facilities will be available?
   Reply: The college swimming pool will be available on a scheduled basis. The main athletic field of the college is approximately one mile from campus. This facility plus park facilities will be available, but none are within walking distance. The college will sponsor a number of recreational programs which will be available to all members in attendance.

   Recreational facilities are numerous and plentiful in the area provided you have some transportation. San Jose is 20 miles from the ocean and 20 miles from a number of very pleasant state parks. San Francisco is just 50 miles to the north.

4. What texts will we be required to purchase?
   Reply: We will be using two books:
   1) Van Vlack, Elements of Materials Science, 2nd Edition, Addison-Wesley Publishing Company. 1964.

2) Earl, Arthur W., Experiments with Materials and Products of Industry, McKnight & McKnight Pub. Co.

3) Jardine, D. S., Vitalized Chemistry or other good basic chemistry text is recommended.

If you have any of these books, please bring them with you--otherwise, they may be purchased on campus. Also bring any other reference books that you might have which contain information on properties, use and selection of industrial materials.

5. What special instructional materials will be needed?
Reply: You will need to have available note paper, pencils and the normal classroom items. If you have a typewriter, it would be desirable to bring it along, but not necessarv. We will make considerable use of overhead projection materials, slides and other audio visual aids. These will be furnished by the Institute. If you have a 35 mm. slide camera you may wish to bring it with you. We will try to work together in taking slides and have them available for everyone that wants them.

6. Will we have the opportunity to take motion pictures?
Reply: Yes, providing the extent of motion pictures does not disrupt the program or the class. Part of the Institute will be the preparation of audio visual materials, and closed loop film can be a valuable part of these materials.

7. Will we be allowed to tape lectures?
Reply: Yes; please bring plenty of tape -- from previous experience, everyone is long-winded.

8. Will we need special clothing or protective equipment for laboratory work?
Reply: A laboratory apron or shop coat is desirable. You will be working with chemicals as well as machine tools. Protective clothing will not be furnished so you should bring it with you. We also have an eye protection law, and if you have a favorite pair of goggles, you may wish to bring them.

9. Where should we report if we plan to arrive on Saturday?
Reply: Most of the apartments will permit you to arrive on Saturday. Due to some type of a technicality, however, the residence halls will not permit occupancy until 10 am on Sunday. If you arrive earlier, we suggest you stay the first night in a motel. We will be glad to make arrangements for you in a motel close to campus.

10. What is the best way to campus from San Francisco airport?
Reply: Your travel agent can arrange for a helicopter flight from San Francisco airport to San Jose airport. You can then

take a cab from the airport to the college. Please let me know your arrival time. If there are a number of people coming in together or if the number is reasonable, I will plan on meeting the flights and bring you to the college.

11. My wife and family will not be able to be with me at San Jose for the entire Institute, but may fly our for the last week. Can arrangements be made so that we could stay together at the residence hall during the last few days?
Reply: Simply specify on the residence hall application which weeks you will be alone and which weeks your wife will be with you and the housing office will make the necessary arrangements.

12. What is the procedure for obtaining the six units of credit for the Institute?
Reply: Six units of credit are automatically awarded when you register on the first day of the Institute. At that time we will ask if there is anyone who does not want credit. If there is, that person will be registered as an audit and will not receive a letter grade for the program. Everyone else will receive credit and a letter grade.

    There is no tuition chargeable to any participant whether he registers for credit or no credit.

13. Would it be possible for my wife to attend summer school at San Jose State?
Reply: Yes, and with my blessings. We will have the summer session office send each person a summer schedule. Your college age children are also welcome to attend.

14. Will a list of reference books be provided for the Institute?
Reply: Louie Melo has provided a list of reference books which is enclosed.

15. Will all reference materials be available at the Institute library?
Reply: The Institute library will be used only by the students in the Institute. However, most books are single copies. As a result, each member is asked to bring his own copy (or purchase a copy from the bookstore) of the two major texts. Also bring any reference books that you might have that are mentioned on the enclosed reference book list.

    The general library holdings are very extensive and will be available to the Institute. Naturally, general library holdings will be shared with other students on campus.

16. What type of clothing is suitable for the San Jose climate?
Reply: The San Jose climate is mild with days normally being in the mid or low 80's. We do get some warm weather and the

temperature could, on occasion, rise to the high 90's, with low humidity. Evenings are often cool and it is very common to put on a sweater around 7:00 or 8:00 pm. We therefore recommend that you bring normal summer clothes plus a sweater or very light jacket for cool evenings or trips to the mountainous areas of the state.

17. How strongly will the 15 mile maximum commute distance be enforced?
Reply: This figure is a reasonable guide. We want to discuss greater commute distances to make sure the person is aware of the traffic problems, etc. For example, there are camp sites in the surrounding mountains. Even though they are about 25 - 30 miles from campus, it is impractical to commute. This regulation was made to discourage commuting from camp sites and also from San Francisco and vicinity.

18. My wife wants to know when you expect your next earthquake! And should we bring survival kits?
Reply: My wife wants to know also. In checking with Louie Melo, our school plant authority, he indicated that the Industrial Studies Building is constructed as a floating solid structure. This means it can rock and bounce without falling apart. While I believe him, I hope it is not tested.

In a more serious vein, earthquakes are unpredictable and one could occur this summer; however, I have been in San Jose for 13 years and have not seen an earthquake do any degree of damage. We have had one or two each year but they are normally of such a minor nature that you realize we had one by reading the newspaper the next day. It is generally conceded that the earthquake threat in San Jose is far less that the tornado threat of the Midwest or the hurricane of the East Coast------

And probably the worst hazard you will encounter is driving to California. If you are driving, please allow plenty of time. We want to have you here in one piece.

APPENDIX O

Copy of Stipend and General Information Letter Sent to All Participants

Dear

This will probably be the last letter you will receive from us before your attendance at the Institute this summer. If other things become available we may send them to you; however, a few of you may plan on leaving soon. If we do send any other information, we will also have it available for you when you come, should you plan on a vacation before attending the Institute. Schools in various parts of the country start dismissing for summer during the latter part of May and early part of June.

QUESTIONNAIRE

Enclosed is a brief questionnaire which we would appreciate your completing and returning to us in the enclosed envelope. This is information which will help us plan for your arrival. An early submission will be appreciated.

BARBECUE

We have now completed final plans for our opening barbecue on Sunday, June 23. It will be a simple hamburger barbecue between the hours of 5 and 8 pm. Since many of you will arrive on Sunday, we will plan or serving you any time during that three-hour period. Please plan on staying briefly or as long as you wish in order to get acquainted with other institute members and the faculty and staff. If you need a ride from the college to our home, please make a note to that effect on the enclosed questionnaire.

Also enclosed with this letter is a map of San Jose and a map which will help you find my home on the San Jose map. My telephone number is also listed, so please feel free to call if you have a problem.

STIPENDS

Your stipends will be provided in two payments. On Friday, June 28, we will provide stipends for the first four weeks of the Institute. Then on Friday, August 2, we will provide stipends for the last two weeks. We calculate your stipend payments as follows:

a. June 28 (4 weeks)	300.00	your allowance
	______	dependent allowance for ____dependents
	______	total

b. August 2 (2 weeks)	150.00	your allowance
	______	dependent allowance
	______	total

If you note any errors on the above listing, please let us know. Otherwise you can expect the checks as indicated and may complete your financial arrangements accordingly.

REPORTING PLACE AND TIME

The first session of the Institute will be on Monday, June 24, at 9:00 am. (We are starting out slow. From Tuesday on, we will start at 8:00 am.) This meeting will be held in the Industrial Studies Building, Room 147. The Industrial Studies Building is on the corner of Ninth and San Fernando, and is shown on the map of the campus included with this letter.

SESSION ON SATURDAY, JUNE 29

One person has indicated that he would be unable to attend on Saturday, June 29. However, he asked that we not cancel modified plans on his account. We hope to work with him and make arrangements so that he will not miss any instructional content. As a result, we will plan to meet on the Saturday and then not meet on Friday, July 5.

PICNIC, FRIDAY, JUNE 28

We estimate that by Friday of the first week, you will be pretty tired of sitting and listening and will be ready for some exercise. As a result, we reserved a picnic area at a local park and will plan on having a late afternoon and evening barbecue at the park. We will leave the details and final arrangements until you arrive. You might want to mark your calendar accordingly.

We are looking forward to having you join us.

Sincerely,

Ralph C. Bohn
Director

Enclosures:
- 3 maps
- Questionnaire
- Self-addressed envelope

QUESTIONNAIRE

TRAVEL PLANS

Mode of transportation____

If by air, flight number_______________________

arrival time _______________________

airport _______________________

Date of arrival ______________________________

ACCOMMODATIONS

Where have you made arrangements to stay? _______________________

How many members of your family are coming with you?______________

Please indicate ages of children who will be coming________________

BARBECUE

Do you plan to attend?________________________

Do you need transportation?____________________

STIPEND CALCULATION

Are there any errors on your stipend calculation?__________________

If so, please indicate error____________________________________

SPECIAL PROBLEMS OR QUESTIONS:

APPENDIX P

Copy of Participant Evaluation Form
The regular form provided adequate space for comments.
The writing space was eliminated in this Appendix.

To assist the staff in planning future institutes, please complete this questionnaire. DO NOT sign your name on this form. The completed form is due on Friday, August 2, 1968.

1. Strengths and Weaknesses - Morning Program

    1.1 In rank order, list the 3 phases of the morning program which you considered to be the most valuable to you.

    1.2 List the weaknesses in the morning program.

    Comments: To assist the Institute Staff, please write your additional comments below.

2. Strengths and Weaknesses - Afternoon Program

    2.1 In rank order, list the 3 phases of the afternoon program which you considered to be the most valuable to you.

    2.2 List the weaknesses in the afternoon program.

    Comments:

INSTRUCTIONS: IN THE BOXES AT THE RIGHT, INDICATE THE VALUE OF THE FOLLOWING AREAS TO YOU.

	VERY GOOD	GOOD	FAIR	POOR
3. Faculty Conducted Program				
3.1 Morning Instruction Industrial Materials Content				
3.11 Lectures	☐	☐	☐	☐
3.12 Demonstrations	☐	☐	☐	☐
3.2 Afternoon Instruction Curriculum & Instructional Materials				
3.21 Film Review & Study Carrels	☐	☐	☐	☐
3.22 Field Testing of Instructional Units	☐	☐	☐	☐

3.23	Usefulness of Instructional Units	☐	☐	☐	☐
3.24	Independent Study Conferences	☐	☐	☐	☐
3.25	Trial Demos in Local Schools	☐	☐	☐	☐
3.26	Large Group Seminars	☐	☐	☐	☐
3.27	Small Group Seminars	☐	☐	☐	☐
3.28	Local Teachers Evaluation of Unit Demos	☐	☐	☐	☐
3.3	Pre & Post Test	☐	☐	☐	☐
3.4	Homework Assignments	☐	☐	☐	☐
3.5	Evaluation & Grading Procedures	☐	☐	☐	☐

Comments:

4. Related Instructional Programs

4.1	Presentations at SJSC Audio-Visual Center	☐	☐	☐	☐
4.2	Brodhead-Garrett Presentation	☐	☐	☐	☐
4.3	Presentation of Mobil Industrial Processes Teaching Devices	☐	☐	☐	☐
4.4	Field Trips				
4.41	San Leandro	☐	☐	☐	☐
4.42	Underwriters Lab	☐	☐	☐	☐
4.43	General Electric	☐	☐	☐	☐

Comments:

5. Institute Related Procedures

5.1	Overall organization of course schedule (schedule of activities)	☐	☐	☐	☐
5.2	Institute Time Schedule -- class hours & days	☐	☐	☐	☐

5.3 Housing Arrangements & handling of related problems (living conditions)	☐	☐	☐	☐
5.4 Social & Recreational Activities Providing Information	☐	☐	☐	☐
5.5 Payment of Stipends-Schedule of handling procedures	☐	☐	☐	☐
5.6 Communications & correspondence prior to Institute	☐	☐	☐	☐
5.7 Recreation Activities	☐	☐	☐	☐

Comments:

6. Institute Support Staff
Services of:

6.1 Director	☐	☐	☐	☐
6.2 Teaching Assistants				
6.21 Industrial Materials (morning)	☐	☐	☐	☐
6.22 Instructional Materials (afternoon)	☐	☐	☐	☐
6.23 Design Assistant	☐	☐	☐	☐
6.24 Photography Assistant	☐	☐	☐	☐
6.3 Secretarial Services	☐	☐	☐	☐

Comments:

7. If the Institute were to be repeated next summer for another group, what specific changes would you recommend? Please explain why as applicable.

8. As a result of your experiences in the Institute, what tentative changes do you hope to make in your program?

APPENDIX Q

Statistical tables developed and furnished by the Measurement Research Center of Iowa

MEASUREMENT RESEARCH CENTER
*** SELECTEE ROSTER ***

LINE NUMBER	SELECTEE NAME			SOC. SEC. NUMBER	FINAL STATUS	FOR MRC USE ONLY	
1	BARDEN	HUGH	C	363-32-9518	X	0903	0001
2	BARNES	ROGER	L	521-38-6012	X	0903	0002
3	BRACO	JOSEPH		212-20-7995	X	0903	0003
4	CHAMPAGNE	WILCY	J	439-44-1224	X	0903	0004
5	CUEVAS	WILLIAM	V	584-28-5043	X	0903	0005
6	DICKERSON	L	W	512-07-6469	X	0903	0006
7	DOUGLAS	WAYNE	A	275-34-9042	X	0903	0007
8	ELLSWORTH	NED	M	526-70-6569	X	0903	0008
9	GEDKER	JOHN	J	475-40-1415	X	0903	0009
10	HOFFER	ROBERT	C	553-38-6601	X	0903	0010
11	ICHIKAWA	BUSTER	K	563-26-9336	X	0903	0011
12	KOPPE	LOTHAR	W	458-74-0494	X	0903	0012
13	LUCERO	AUSTIN	E	554-46-8095	X	0903	0013
14	MARICH	STANLEY		516-20-9238	X	0903	0014
15	MC ATEE	WILLARD	R	537-18-9944	X	0903	0015
16	MC COLLUM	JOHN	C	441-05-3169	X	0903	0016
17	MC KNIGHT	THAYNE		439-56-9596	X	0903	0017
18	MULLER	ARTHUR	E	468-36-5867	X	0903	0018
19	PETERS	JAMES	R	559-52-7896	X	0903	0019
20	PICKETT	LELAND	R	541-30-5429	X	0903	0020
21	SCHOENIKE	GERALD	W	397-34-0059	X	0903	0021
22	SLOWE	ALFRED	J	021-22-0207	X	0903	0022
23	WHALEY	DONALD	C	255-40-9438	X	0903	0023
24	WOOLCOTT	EARL	E	362-20-8318	X	0903	0024

NUMBER OF PARTICIPANTS LISTED ON ROSTER. 24

NUMBER OF NEW PARTICIPANTS NOT LISTED ON ROSTER. 0

TOTAL NUMBER OF PARTICIPANTS ACTUALLY ENROLLED 24

APPENDIX R

Statistical Table developed and furnished by
the Measurement Research Center of Iowa

HEADER CARD

1.	TOTAL OF APPLICANT RECORD CARDS SUBMITTED	212
	A. NUMBER OF SELECTEES	24
	B. NUMBER OF NON-SELECTEES	188
2.	HOW MANY DEPENDENTS WERE CLAIMED BY INDIVIDUALS DESIGNATED AS SELECTEES? (FROM ITEM 9 OF OE4401):	81
3.	HOW MANY INDIVIDUALS DESIGNATED AS SELECTEES ARE INVOLVED IN THE TEACHING (ETC.) OF SPECIAL CLASSES FOR HANDICAPPED CHILDREN AND YOUTH? (FROM ITEM 26 OF OE4401)	6
	OF THESE, HOW MANY ARE IN SCHOOLS WHICH ARE:	
	A. PRIMARILY FOR EXCLUSIVELY FOR THE HANDICAPPED?	1
	B. ONLY INCIDENTALLY FOR THE HANDICAPPED?	5
4.	A. APPROXIMATE NUMBER OF INQUIRIES FROM POTENTIAL APPLICANTS.	615
	B. NUMBER OF APPLICATION PACKETS MAILED OUT TO POTENTIAL APPLICANTS.	420
	C. NUMBER OF COMPLETED APPLICATIONS RETURNED	212
	D. OF THE COMPLETED APPLICATIONS RETURNED, HOW MANY WERE FROM "FIRST-RANK" APPLICANTS?	184
	E. NUMBER OF APPLICANTS WHO WERE OFFERED ADMISSION BUT DECLINED	8

APPENDIX S

Copy of Film Review Card

TITLE: ____

AMOUNT USABLE: 1/4 1/2 3/4 ALL

LEVEL: _____JUNIOR HIGH _____SENIOR HIGH _____COLLEGE

RATING: POOR FAIR GOOD EXCELLENT

CONTENT: ____

____

____

____

NAME: ____

APPENDIX T

Typical Unit Prepared During the Institute

PRESENTED BY: Austin E. Lucero
Adrian Wilcox High School
Santa Clara, California

INSTRUCTIONAL LEVEL: High School

TITLE: Relative Activity of Metals and its Effect on the Electrical Potential

PRESENTATION TIME: 2 hours

INTRODUCTION:

Probably one of the first subjects covered in the area of electricity is the subject of atomic theory, and secondly the creation of electricity through the use of electrolyte, and dissimilar metals or materials. In short, the subject is the battery and its capabilities. Therefore, this unit would help to reinforce that material which has previously been covered as well as introduce new materials.

OBJECTIVES:

1. To reinforce battery theory previously taught.
2. To demonstrate that one metal will give up its electrons to a less active metal if there is an electrolyte and contact of some source.
3. To demonstrate that a potential is generated between metals or that an unbalanced condition exists and that every unbalanced condition in nature becomes balanced through the reaction of physical forces.
4. To depict the effect of magnetism on metals of different activity ratings

INTER-RELATION WITH OTHER SUBJECTS:

UNIT SUBJECT AREA: Electricity/Electronics

INTER-RELATION WITH OTHER SUBJECTS:

In chemistry classes the periodic chart is one of the primary items discussed, however, when one says that a given metal is active, very frequently the only proof given is the demonstration which requires that pure sodium be placed in water. The physics class also uses batteries and since batteries are metal utilizing bodies, it is felt that this unit can be of help in this area.

USE IN INDUSTRY:

Sacrificial metal processes are commonly applied in industry -- consider the outboard motor which is protected against corrosion by a small piece of active metal which is attached to the submerged portion of the motor.

MATERIALS AND EQUIPMENT:
voltmeter
ammeter
NaCl (sodium chloride) table salt
variety of metals
H_2O (water - not distilled)
different types of wire

EDUCATIONAL MEDIA:
transparencies
demonstration
metals activity chart

UTILIZATION IN THE TEACHING-LEARNING ENVIRONMENT:

SAFETY:
No hazard - unless caustic solution substituted for electrolyte.

PRESENTATION:

1. Give a short introduction to:
   a. Metal valence and electron number
   b. Use transparency - "Electrode Potential of Metals"
2. Perform experiment to class following attached descriptions
3. Conclusion as appropriate
4. Transparencies 2, 3, and 4

EVALUATION AND OBSERVATION:

STUDENT PERFORMANCE:
I paragraph written explanation of what students have seen.

UNIT EVALUATION:
Have the students design the most powerful potential difference, after having been given several different metals. Once designed, have the students test their theories.

DEFINITION OF TERMS:
Sacrificial metals - destroys itself when it is coupled with or made to come in contact with another metal
Magnetic industion - magnetic industion is the process by which electricity is created in a conductor when that conductor is passed through a magnetic field

REFERENCES:

STUDENT:
Buban & Schmidt - Electricity

TEACHER:
Carl A. Keyser - Materials Science in Engineering
Van Vlack - Elements of Materials Science

EXPERIMENT: ELECTRICAL POTENTIAL AND CONDUCTIVITY OF DIFFERENT METALS

MATERIALS & EQUIPMENT:
strips of a variety of metals - the same size
voltmeter
ammeter
resistor - 100 ohms
tap water
salt water - tap water & NaCl
several glass beakers

PROCEDURE:
Select the most active metal of the cut strips (in this case it was zinc) and use that metal as a reference point. Place that metal in each beaker, with a different metal, as illustrated in Fig. 1.

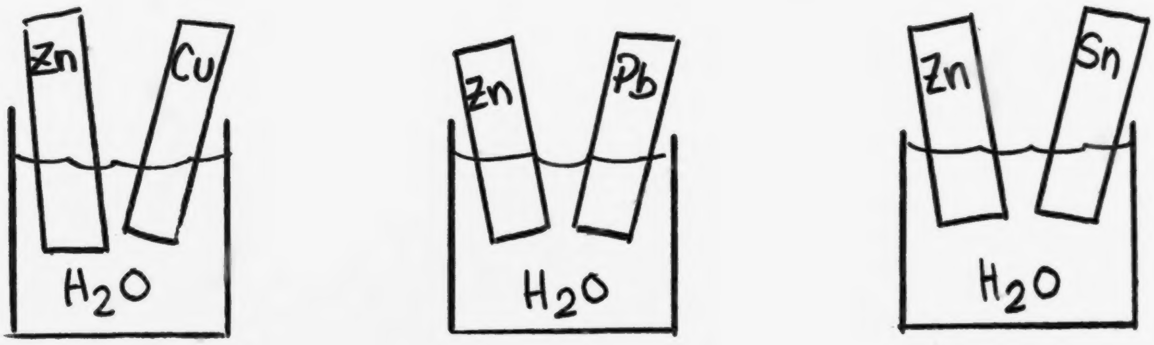
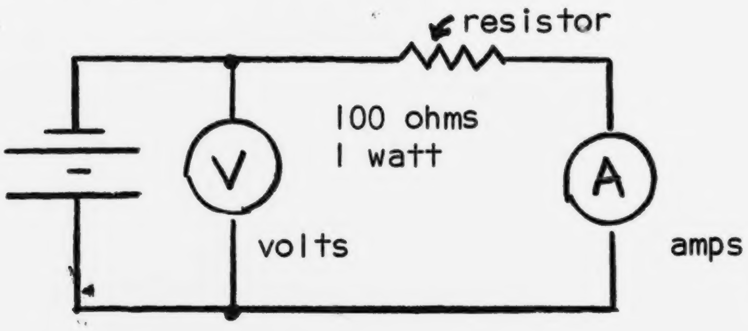


Figure 1

This particular experiment utilized zinc, copper, and tin. The results of each experiment were tabulated as indicated in Table A. The electrical circuit uses the standard battery symbol to depict the dissimilar metals in the electrolyte.



ELECTROLYTE	MATERIALS	NO LOAD		FULL LOAD		DOUBLE METAL SURFACE	
		VOLTAGE	CURRENT	VOLTAGE	CURRENT	VOLTS (LOAD)	CURRENT (LOAD)
H_2O (tap)	copper zinc	1	0	.25	.2	.25	3 ma
	zinc zinc	0	0	0	0		
	zinc tin	.7	0	.1	near zero		

CONCLUSIONS:

The wider the range between the selected metals on the activity metals chart, the higher the voltage reading. If a metal's surface area in increased, the voltage remains the same and the current increases. Two similar metals will not create any voltage.

EXPERIMENT: HOW TO DEMONSTRATE ACTIVITY OF METALS

MATERIALS:

sodium metal
beaker
tap water
phenolph thalein

PROCEDURE:

Fill a beaker about half full with water. Carefully remove the sodium metal form its special container. Do not touch the sodium to your unprotected skin because the metal will react with your body moisture. (The piece of metal should be no larger than a pea or 1/4 inch in diameter) Place the sodium in the beaker of water and observe the reaction.

In order to illustrate to the students what has taken place in the beaker, drop some phenolph thalein in the beaker and again observe the reaction. (Or you can use litmus paper). The water will turn blue if the solution is base, red if it is an acid.

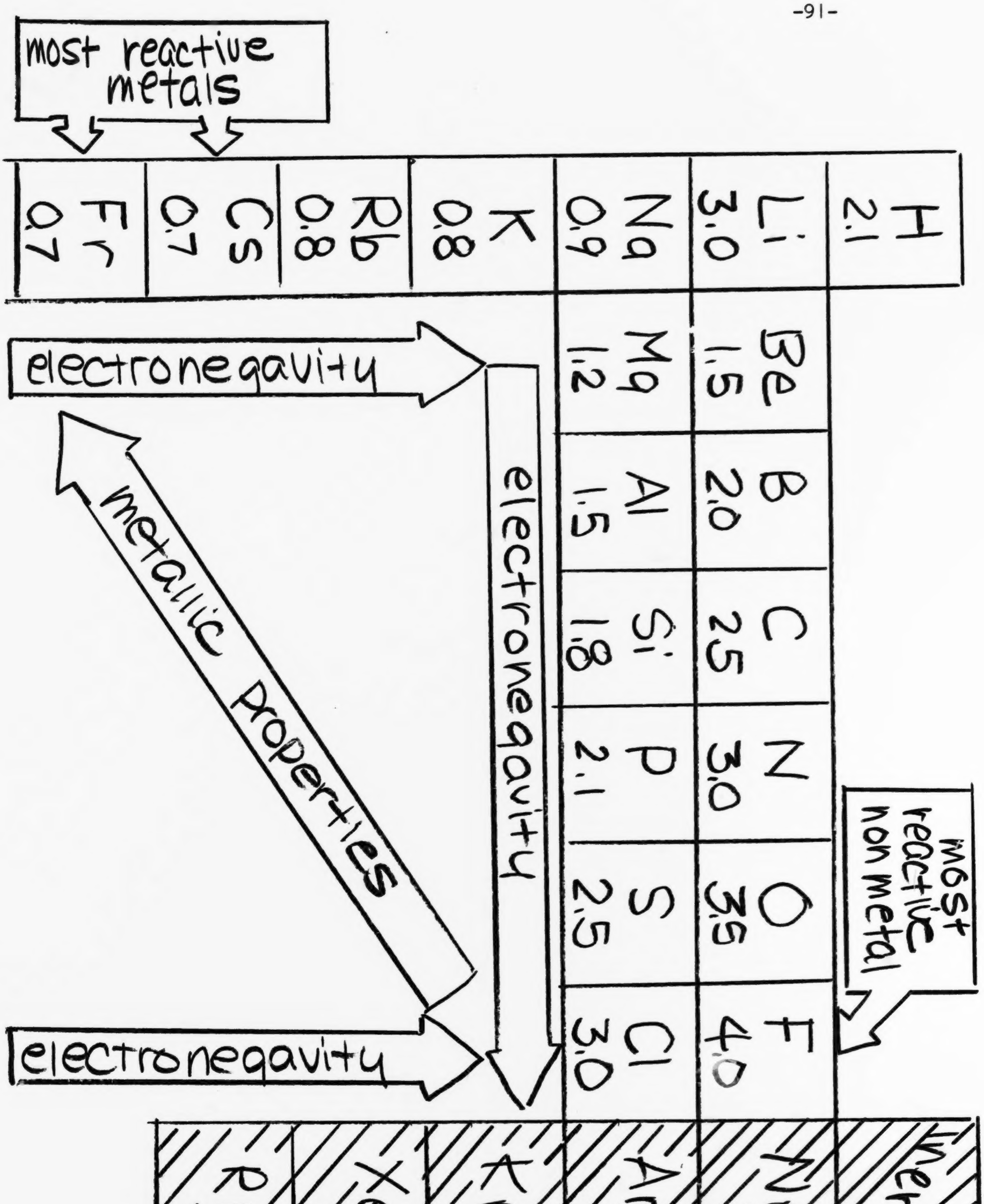
CONCLUSION:

The sodium is so active that it destroys itself adn this can be observed in two ways: (1) the metal disappears, and (2) the water looses its semi-neutral state.

ELECTRODE POTENTIAL OF METALS

METAL ION	POTENTIAL
LI^+(BASE)	+2.96 (ANODIC)
K^+	+2.92
CA^{2+}	+2.90
NA^+	+2.71
MG^{2+}	+2.40
AL^{3+}	+1.70
ZN^{2+}	+0.76
CR^{2+}	+0.56
FE^{2+}	+0.44
NI^{2+}	+0.23
SN^{2+}	+0.14
PB^{2+}	+0.12
FE^{3+}	+0.045
H^+	0.000 (REF)
CU^{2+}	-0.34
CU^+	-0.47
AG^+	-0.80
PT^{4+}	-0.86
AU^+ (NOBLE)	-1.50 (CATHODIC)

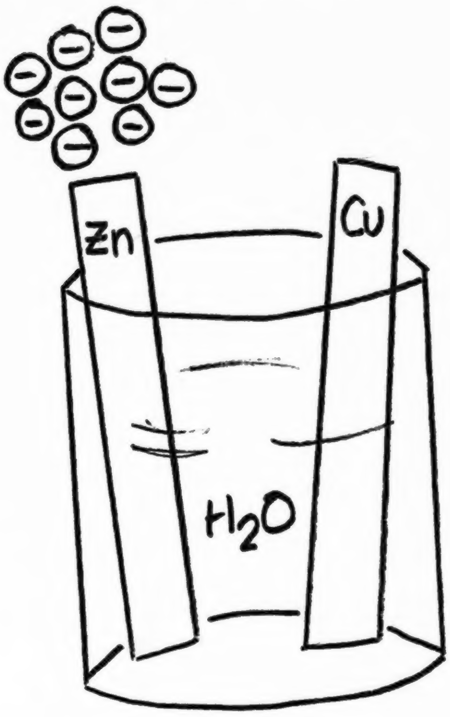
AN ACTIVE METAL WILL DESTROY ITSELF BY GIVING UP ELECTRONS TO A LESS ACTIVE METAL. THE ACTIVE OR DONOR METAL IS CALLED THE ANODE - THE ACCEPTOR IS CALLED THE CATHODE.



H 2.1							inert
Li 3.0	Be 1.5	B 2.0	C 2.5	N 3.0	O 3.5	F 4.0	Ne
Na 0.9	Mg 1.2	Al 1.5	Si 1.8	P 2.1	S 2.5	Cl 3.0	Ar
K 0.8							Kr
Rb 0.8							Xe
Cs 0.7							
Fr 0.7							Rn

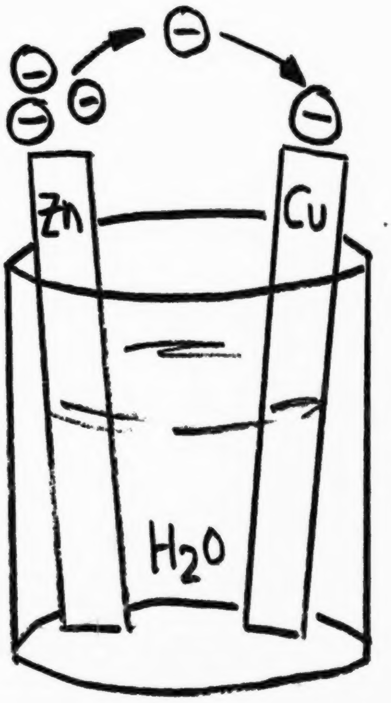
TRANSPARENCY NO. 2

METALS THAT ARE CHEMICALLY ACTIVE WILL, WHEN CONNECTED TO LESS ACTIVE METALS, DESTROY THEMSELVES ATTEMPTING TO BALANCE AN UNBALANCED CONDITION.



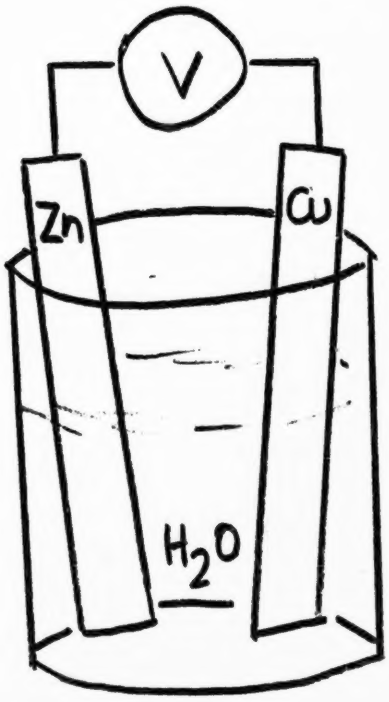
ABUNDANCE OF ELECTRONS

CREATES UNBALANCE



ELECTRONS KICKED OFF

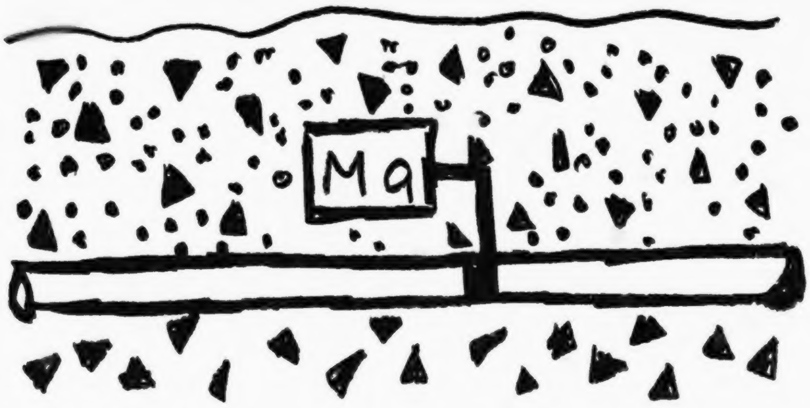
TO BALANCE CONDITION



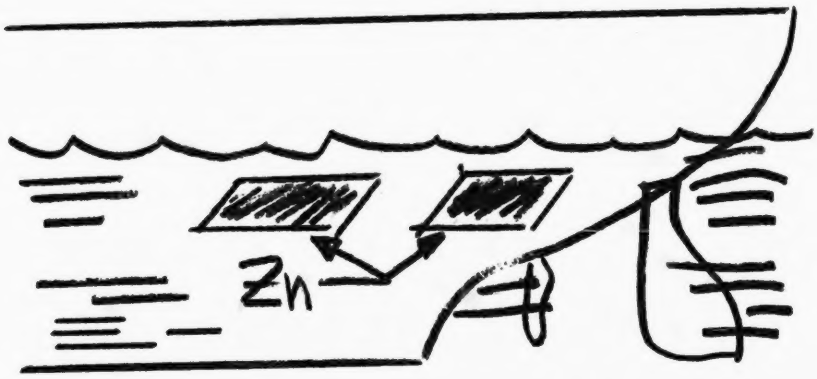
THIS ACTION IS MEASURABLE

TRANSPARENCY NO. 3

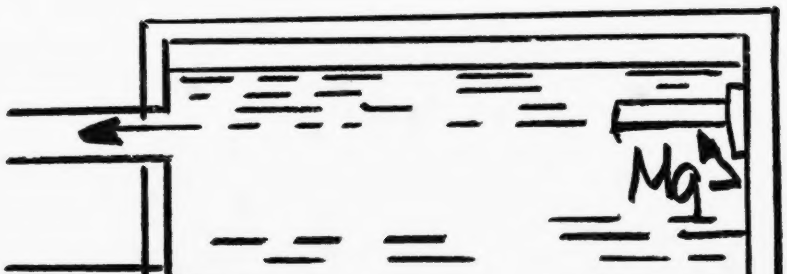
sacrificial anodes



buried Mg plates along a pipeline



Zinc plates on ship hulls



Mg bar in an industrial hot water tank

TRANSPARENCY NO. 4

APPENDIX U

Copy of Letter Sent to Participants Supervisors after the Institute

Dear

Early this spring you recommended that we accept Mr. ____________ into our NDEA Title XI Institute for Advanced Study in Industrial Arts - Industrial Materials. We are pleased to inform you that we followed you recommendation and Mr. ________ has successfully completed the six week institute.

His contribution to the instructional program was excellent. He participated in the exhaustive study of industrial materials conducted by the staff. In addition, he assisted in the preparation of instructional units. These units include complete outlines, overhead transparencies, 35 mm slides, and planned student activities. It is hoped that these units will lower the level of abstraction of the study of industrial materials, permitting more students to profit from this important area of study. Many of the units were field tested in selected junior and senior high schools in the San Jose area.

We hope that you will encourage Mr. ________ to continue his development of instructional materials, and make use of the knowledge and information he gained this summer. This encouragement will help him integrate his new knowledge into his existing program of instruction.

In addition, we suggest that Mr. ________ be encouraged to share his experiences by conducting inservice workshops for industrial arts teachers in your area. We believe he has the background and ability to do this successfully.

It was our pleasure to have Mr. ________ with us this summer.

Sincerely,

Ralph C. Bohn
Director, NDEA Institute
Industrial Arts

APPENDIX V

Copy of News Release

Mr. __________ attended a National Defense Education Act Institute in Industrial Arts at San Jose State College, California, from June 24 to August 2, 1968. The Institute provided an opportunity to study a wide array of industrial materials, including plastics, hydrocarbon fuels, nuclear fuels, metals, ceramic materials, woods and wood products, adhesives, finishing materials, and other materials commonly used in industry. Emphasis was placed on developing an understanding of the materials, their properties and use.

An important aspect of the program was the preparation of instructional units designed to bring the instruction into current secondary school industrial arts programs. Many of the units were tested by the teachers in the San Jose Public Secondary schools. Teachers from the Institute taught the units in junior and senior high school summer sessions to determine whether the units were bringing the level of abstraction down to the appropriate level. Such factors as student interest, motivation, and learning were studied during these presentations.

The Institute faculty and teachers in attendance hope that their participation will help improve the teaching of industrial materials within the industrial arts programs of the nation.